C&T SOLUTION INC.

BX-PIB0x

3rd Generation Intel® Core™ i7/i5/i3 Embedded Box System

User's Manual
Version 100
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Preface

Revision History

Rev.	Date	Description
100	03/10/2014	Initial release

Disclaimer

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Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. Please recycle to minimize pollution and ensure environment protection.

Safety Precautions

Before installing and using the equipment, please read the following precautions:

- Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
- The power outlet shall be installed near the equipment and shall be easily accessible.
- Turn off the system power and disconnect the power cord from its source before making any installation. Be sure both the system and the external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the equipment is properly grounded.
- When the power is connected, never open the equipment. The equipment should be opened only by qualified service personnel.
- Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
- Disconnect this equipment from the power before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
- Avoid the dusty, humidity and temperature extremes.
- Do not place heavy objects on the equipment.
- If the equipment is not used for long time, disconnect it from the power to avoid being damaged by transient over-voltage.
- The storage temperature shall be above -20°C and below 80° C.
- The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.
- If one of the following situation arises, get the equipment checked be service personnel:
  - The power cord or plug is damaged.
  - Liquid has penetrated into the equipment.
  - The equipment has been exposed to moisture.
  - The equipment does not work well or it cannot work according the user's manual.
  - The equipment has been dropped and damaged.
  - The equipment has obvious signs of breakage.

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1. Introduction

1.1 Product Description

The BX-PIB0x is a compact embedded system that is ideal for limited space. Its fanless design with solid sealed aluminum enclosure provides the ideal solution for high-vibration and dusty environments.

The BX-PIB0x is an embedded system that supports 3rd Generation Intel® Core™ i7/i5/i3 and Celeron processors (Socket G2) with Intel® QM77 Express chipset. It has two 204-pin DDR3/DDR3L SODIMM sockets for memory maximum up to 32GB. Featured are a full range of I/O, including two Gigabit Ethernet ports, four USB 3.0 ports, two USB 2.0 ports, one 8-bit GPIO port, VGA/HDMI/DisplayPort graphics outputs, and four RS-232/RS-422/RS-485 serial ports. Two external 2.5” SATA drive bays provide swappable storage, while two Mini-PCIe slots for 3G/Wi-FI and optional 2x PCI/PCIe slots are available for expansion.

The BX-PIB0x is based on the CT-CIB61 COM Express Type 6 Module. For more detailed information (including watchdog timer configuration), please refer to the **CT-CIB61 User’s Manual: http://www.candtsolution.com/product_detail/63**.

1.2 Specifications

- **CPU**
  - 3rd Generation Mobile Intel® Core™ i7/i5/i3 or Celeron Processor (Socket G2 - FCPGA988)
    - Intel® Core™ i7-3610QE Processor
    - Intel® Core™ i5-3610ME Processor
    - Intel® Core™ i3-3120ME Processor
    - Intel® Celeron® Processor 1020E
- **Chipset**
  - Intel® QM77 Express Chipset
- **System Memory**
  - Two 204-pin DDR3 /DDR3L SODIMM sockets
  - Up to 1600MHz
  - Up to 32GB
- **BIOS**
  - AMI uEFI BIOS
  - 8MB SPI Flash ROM
- **iAMT**
  - iAMT8.0
- **Graphics**
  - Intel® HD Graphics 4000 integrated on processor
  - Supports up to three displays
  - Resolution up to 2560x1600
  - VGA interface supports up to WQXGA 2560x1600
  - DisplayPort up to 1920x1200
  - HDMI up to 2560x1600
- **Ethernet**
  - Intel® 82579LM GbE PHY
  - Intel® 1210AT GbE Controller
  - Two 10/100/1000BASE-T
- **Audio**
  - Realtek ALC886 HD audio codec
- **USB Interfaces**
  - Two USB 2.0 ports
  - Four USB 3.0 ports
- **Serial Ports**
  - Four RS-232/422/485

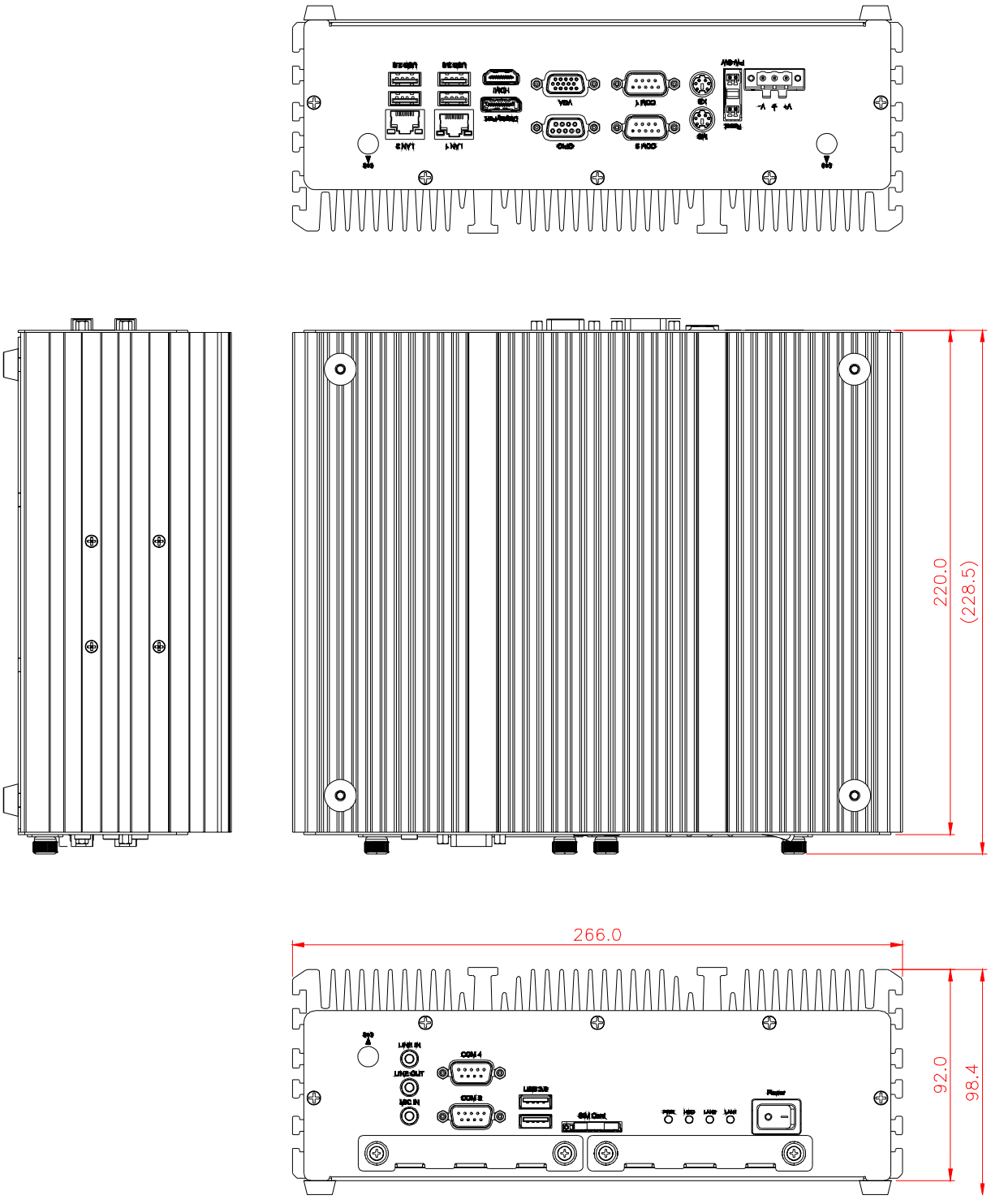
- **Expansion Interfaces**
  - Two Mini-PCIe slots (full and half size) for 3G/Wi-FI
  - 1x PClex 16 slot, 1x PCIe x4 slot (BX-PIB02 model)
  - 2x PCI slots (BX-PIB03 model)
  - SIM card socket
- **8-bit GPIO**
- **PS/2 KB/MS**
- **Storage**
  - Two 2.5” SATA swappable drive bays
- **Watchdog Timer**
- **H/W Monitor**
- **Power Management**
  - ACPI 3.0 compliant
- **Power Input**
  - DC +9V ~ +36V input
- **Power Management**
  - ACPI (Advanced Configuration and Power Interface) 3.0
- **Operating Temperature**
  - 0° C to 60° C
- **Storage Temperature**
  - -20°C - +80°C
- **Operating Humidity**
  - 10% to 90% relative humidity, non-condensing
- **Dimensions**
  - 266.0 x 98.4 x 228.5 mm (W x H x D) - BX-PIB01 model
  - 266.0 x 148.6 x 228.5 mm (W x H x D) - BX-PIB02/03 models
- **Certifications**
  - FCC Class A

1.3 Available Models

Model Number	Features
BX-PIB01	Fanless Barebone Box System w/ Socket G2 for 3rd Gen Mobile lntel® Processor, QM77, 2x DDR3 SODIMM, 4x COM, 2x GbE, 4x USB 3.0, 2x USB 2.0, Audio, iAMT 8.0, 1x SIM card socket, 2x Mini-PCIe slots, 2x 2.5” SATA drive bays, PS/2 KB/MS
BX-PIB02	1xDDR3, 6xCOM, 2xGbE, 4xUSB3.0, 2xUSB2.0, Audio, iAMT7.0, mini-PCIe slot, 2.5” HDD drive bay
BX-PIB03	1xDDR3, 6xCOM, 2xGbE, 4xUSB3.0, 2xUSB2.0, Audio, iAMT7.0, mini-PCIe slot, 2.5” HDD drive bay
Wall Mount Kit	Optional wall mount brackets (ordered separately)

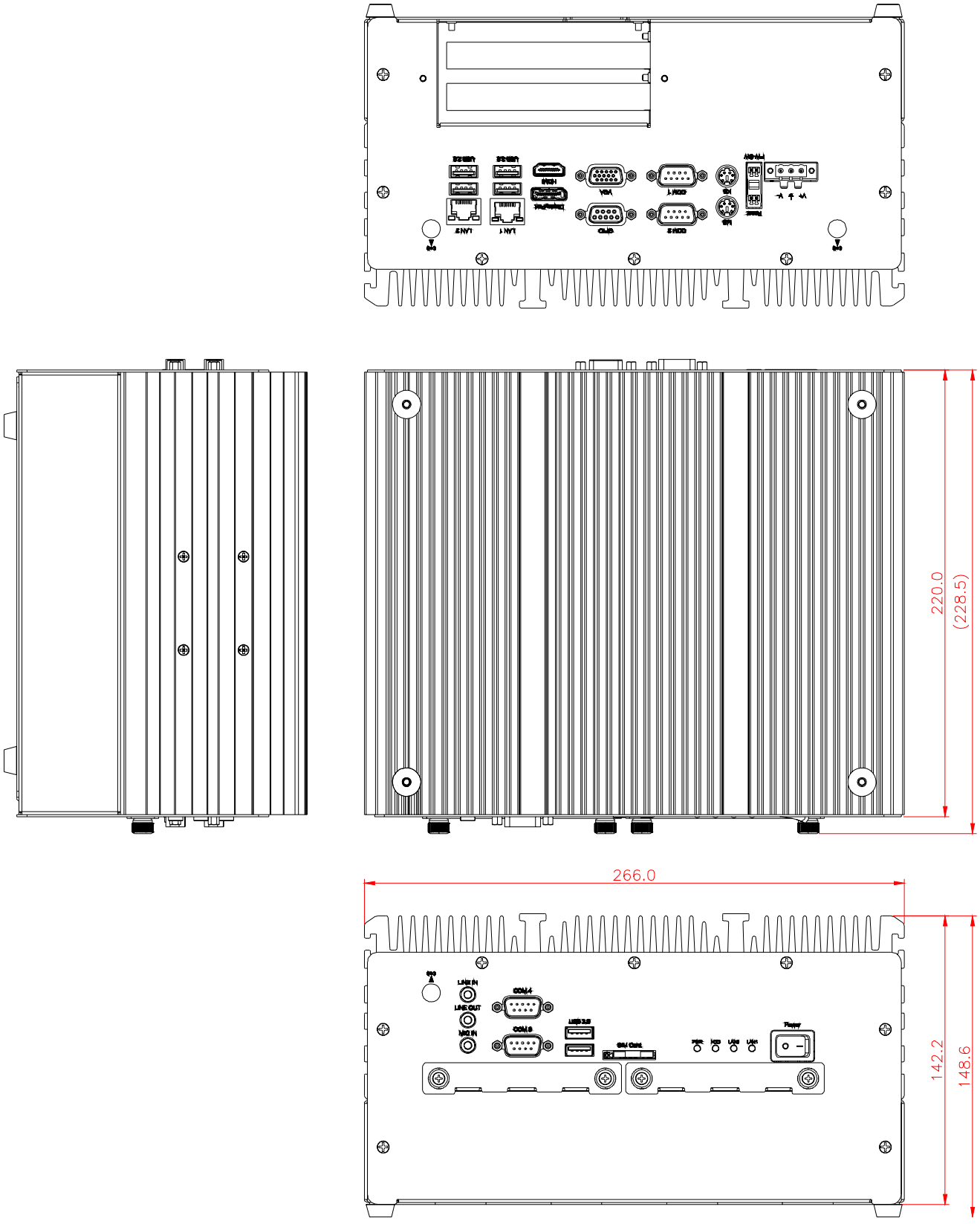
1.4 Mechanical Drawing

1.4.1 BX-PIB01 Dimensions



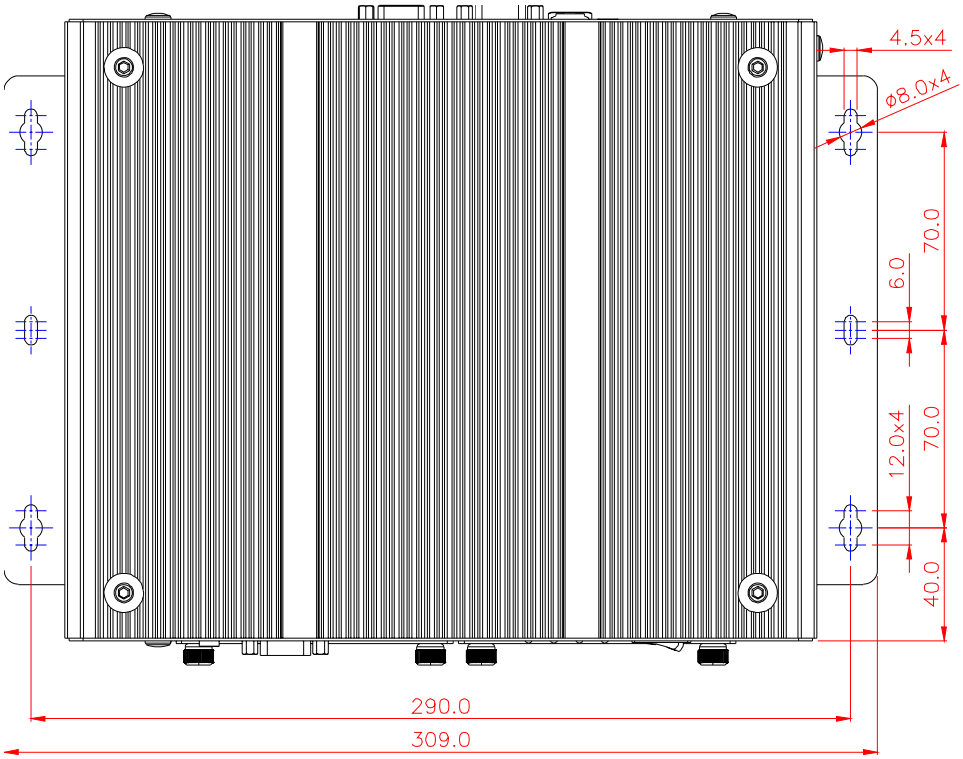
Units: mm

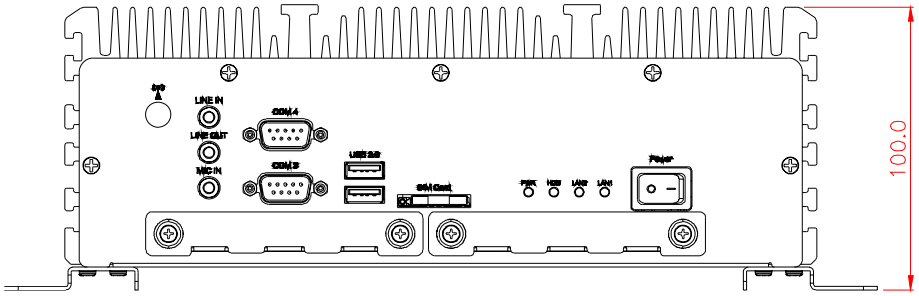
1.4.2 BX-PIB02/03 Dimensions

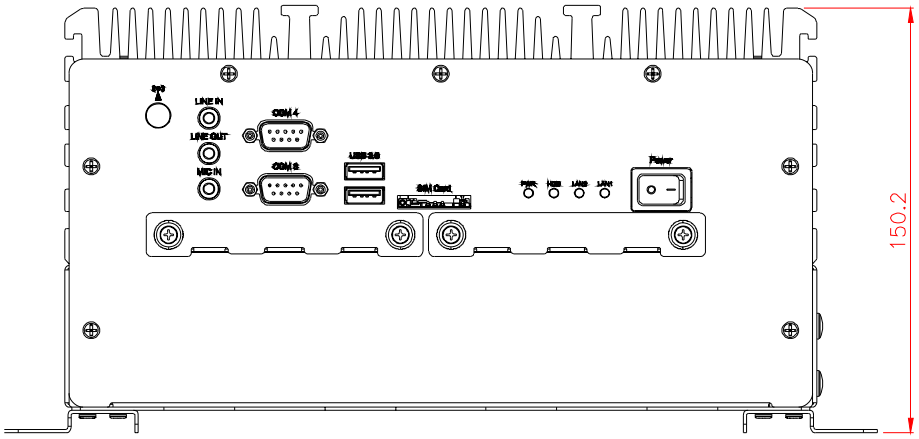


Units: mm

1.4.3 BX-PIB0x Wall Mount Dimensions







Units: mm

2. Getting Started

The following chapter describes how to set up and operate the BX-PIB0x.

2.1 Preparation

Unpack the contents of the shipping carton. Please check that your package contains the items below. If you discover damaged or missing items, please contact your vendor.

- BX-PIB0x Embedded Box System
- AC-to-DC Adapter (90W, 100-240V 2.5A 50~60Hz in, 19VDC 4.73A out)
- Driver DVD
- Accessory pack

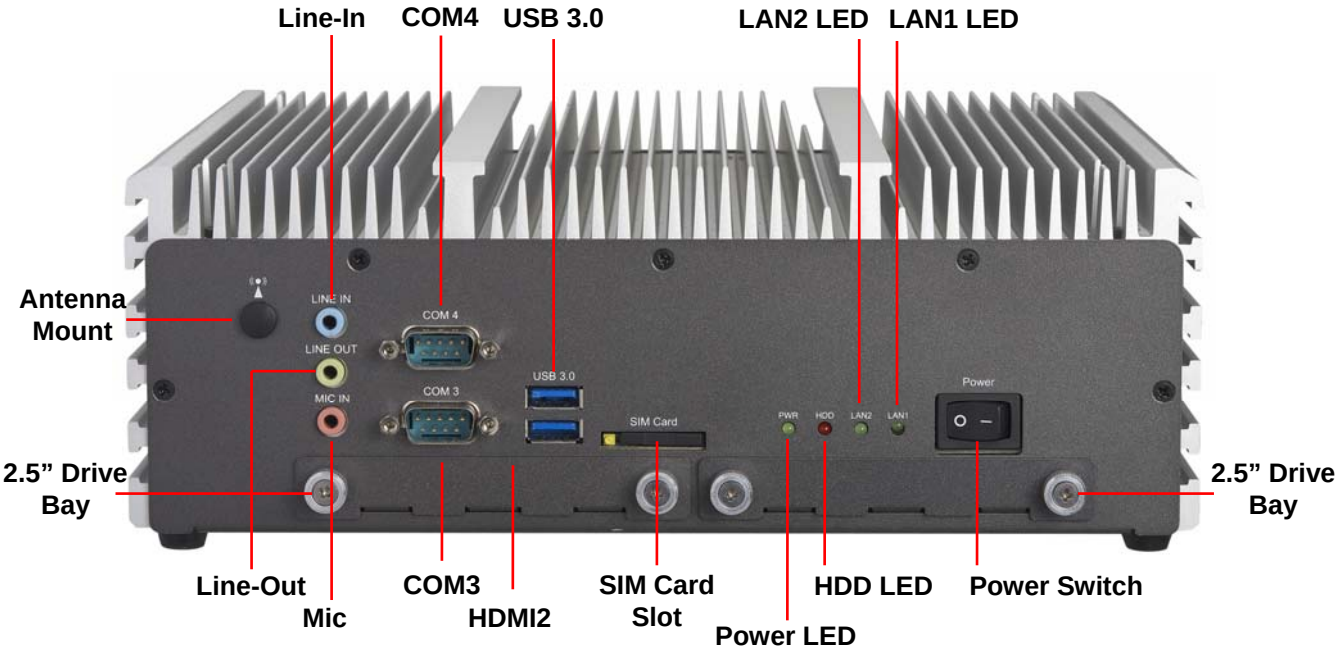
Do NOT install or apply power to equipment that is damaged or if there is missing/incomplete equipment. Retain the shipping carton and packing materials for inspection. Please contact your dealer/vendor immediately for assistance. Obtain authorization from your dealer before returning any product.

Place the system on a flat work surface. Ensure there is sufficient airflow clearance around the chassis.

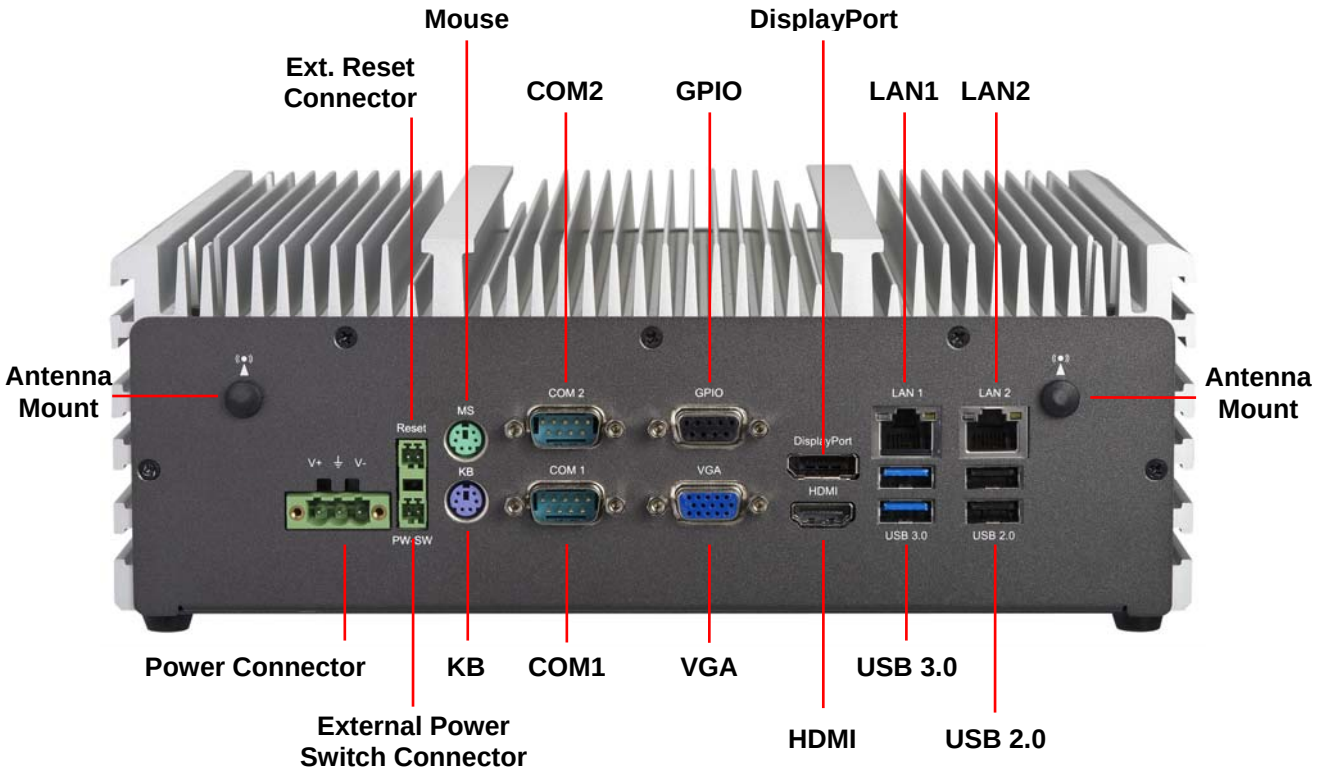
To prevent damage to the system, ensure there is sufficient clearance around the air vents for unrestricted airflow. The air temperature inside the enclosure could rise above the specified operating temperature limits if the airflow through the vents is restricted.

2.2 Chassis Layout

2.2.1 Front View

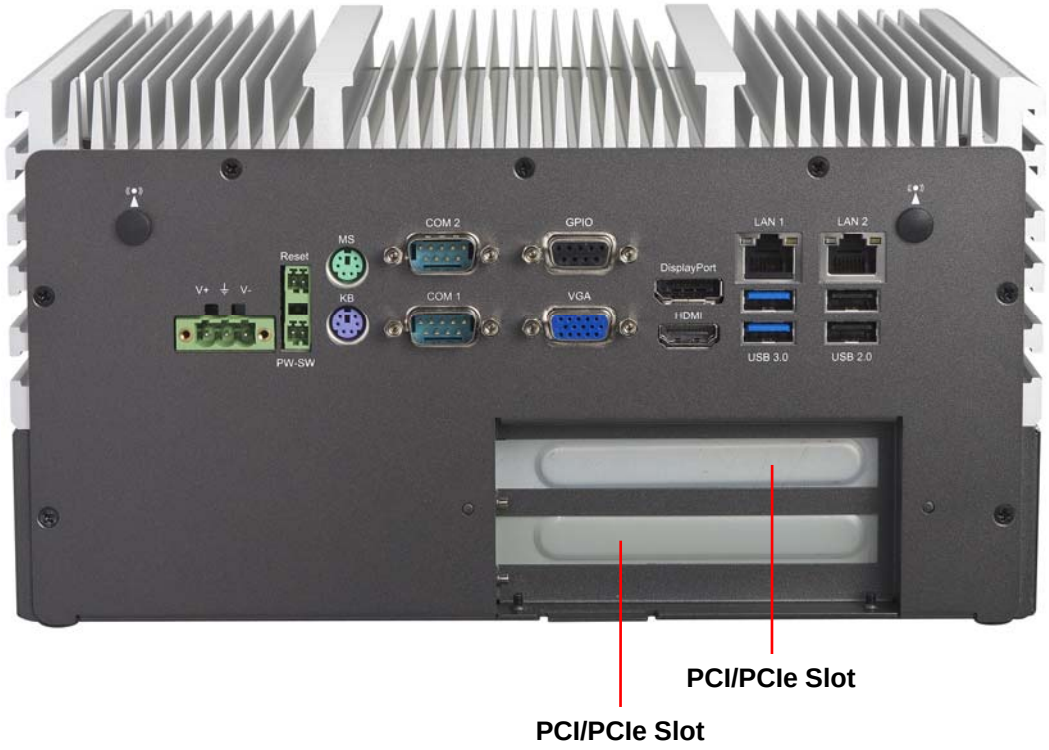


2.2.2 Rear View



2.2.3 PCI/PCIe Expansion Slots

BX-PIB02/03 models only



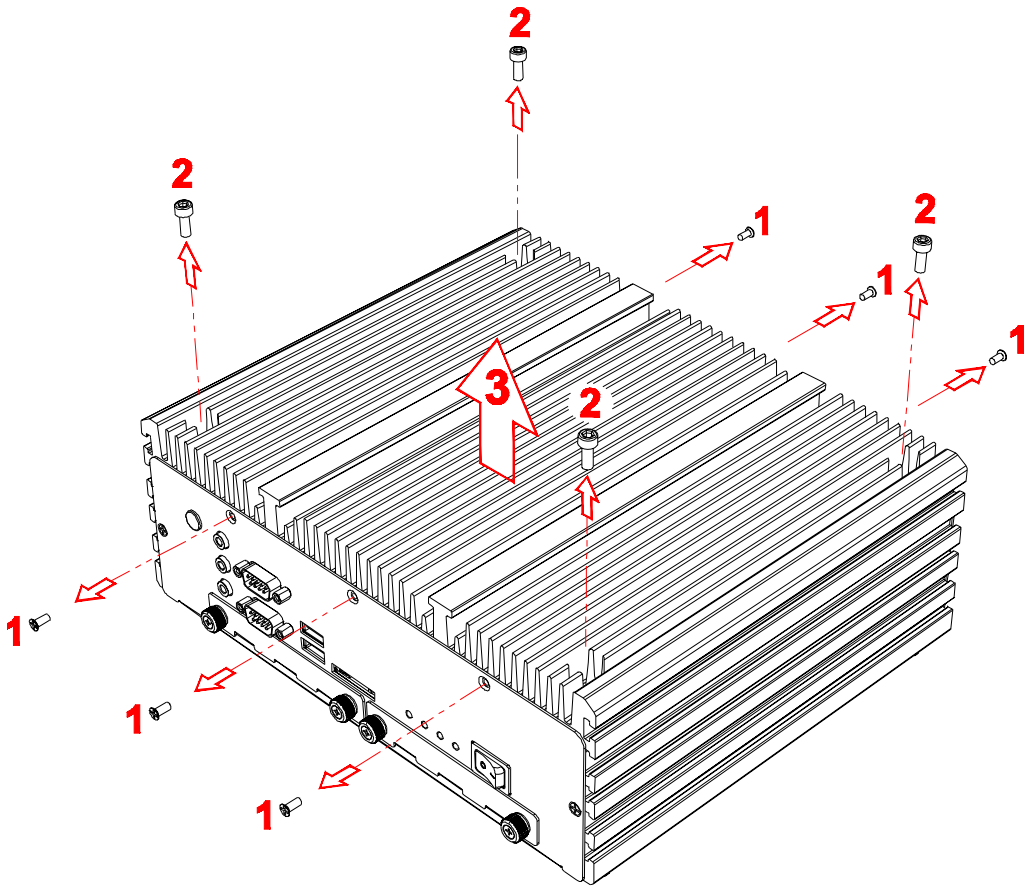
2.3 Installing Internal Components

CAUTION:

Before removing the cover, make sure the system has been shut down and the power cord has been unplugged.

2.3.1 Removing the Top Cover

1. Remove the three screws from the front panel and the three screws from the rear panel.
2. Remove the four Allen screws (3 mm) from the top of the cover.
3. Lift the cover off of the chassis.



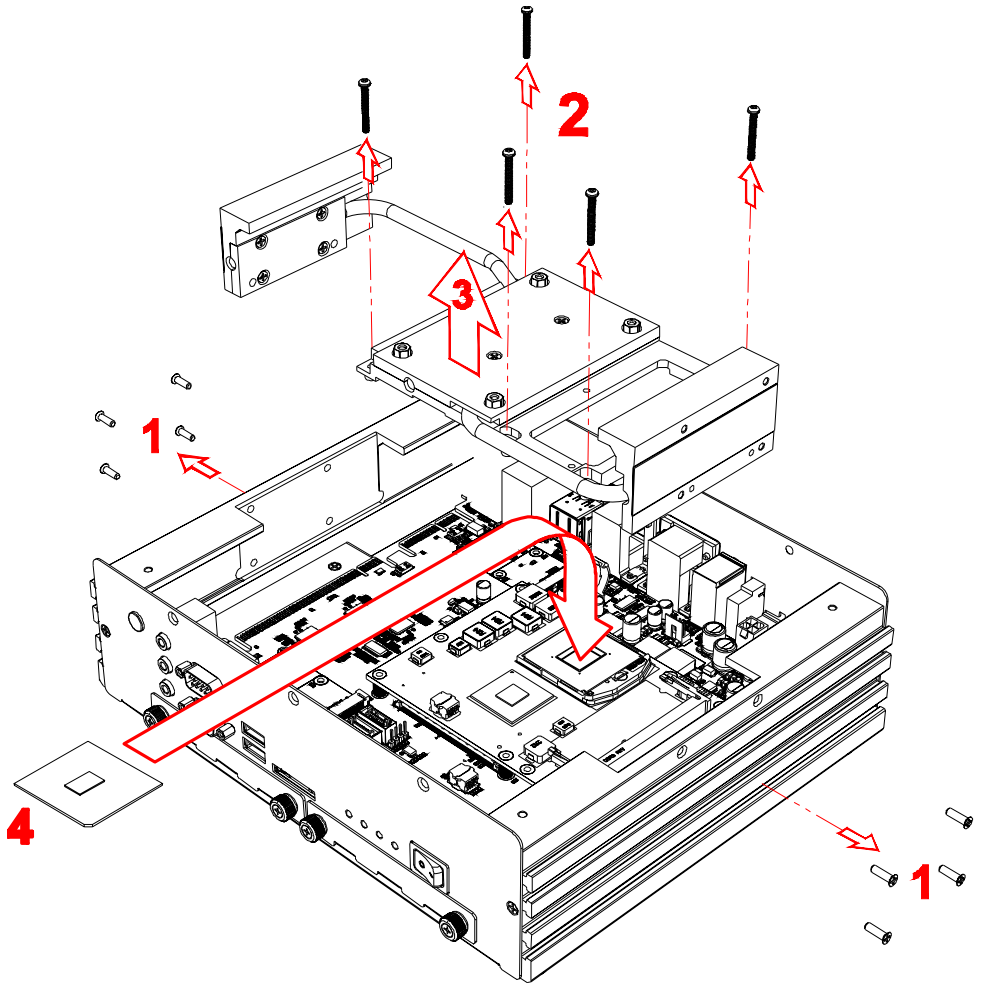
4. To replace the cover, reverse the steps above.

CAUTION:

Check that the thermal pads have not been damaged. Improper thermal contact between the heat spreader and heat sink may result in overheating and damage to the system.

2.3.2 Installing a CPU

1. Remove the four screws securing the heat pipe assembly to each side of the chassis.
2. Remove the five screws securing the main heat spreader to the COM Express module.
3. Carefully lift the thermal module assembly out of the chassis, being careful not to bend the heat pipes.
4. Remove any protective films from the heat spreader as required.
5. Install the CPU.

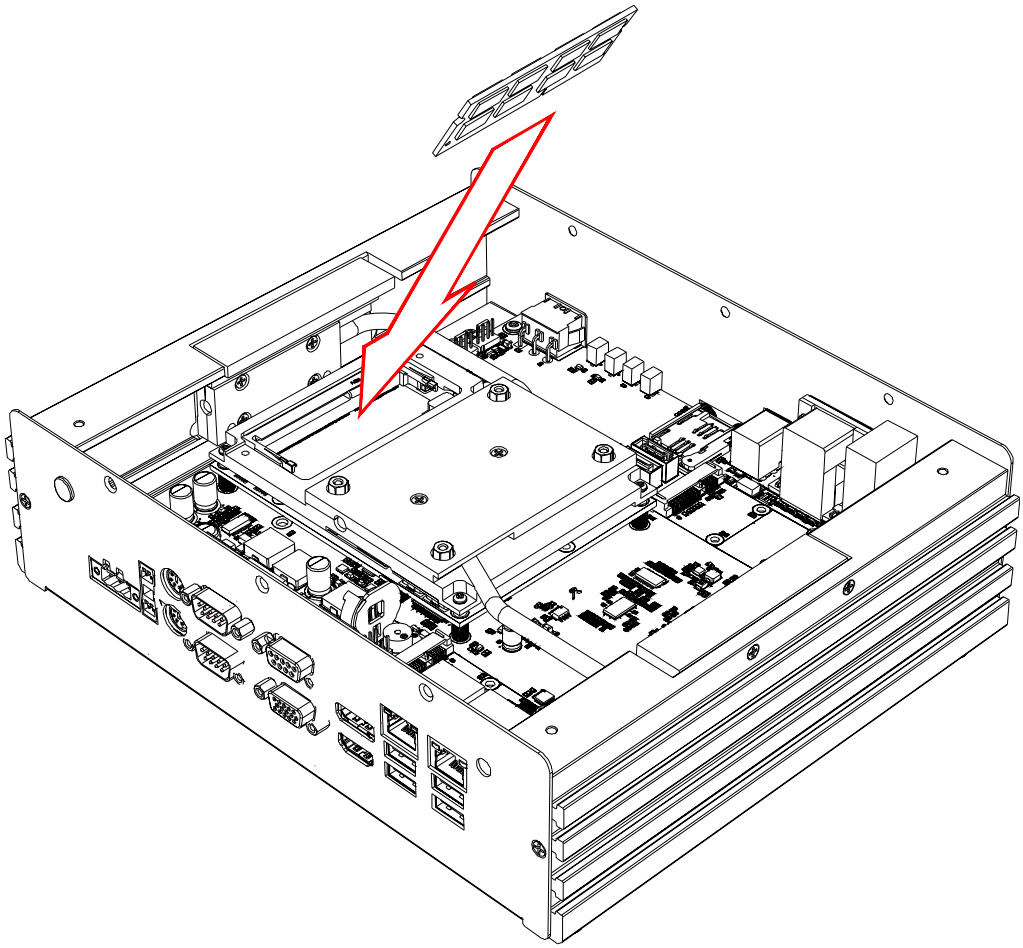


5. Replace the thermal module assembly into the chassis and reverse the steps above to secure it.

CAUTION:	Check that the thermal pads have not been damaged. Improper thermal contact between the heat spreader and heat sink may result in overheating and damage to the system.

2.3.3 Installing Memory Modules

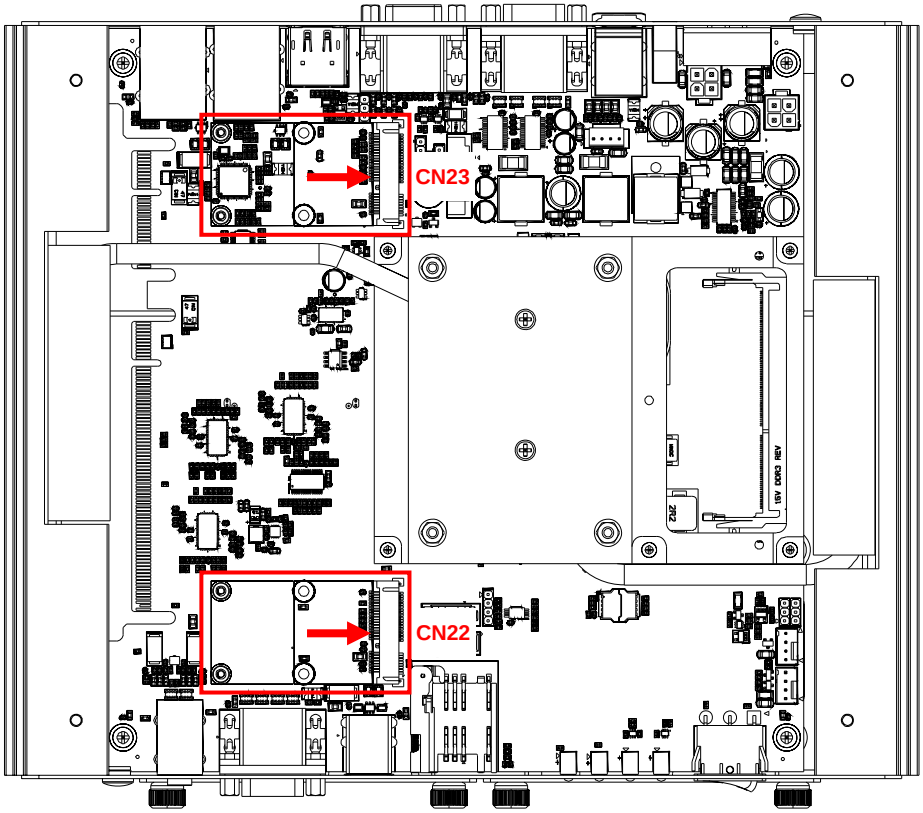
1. Remove the cover from the chassis as described above.
2. Locate the memory socket at the left hand side when facing the front panel.
3. Insert the memory module into the socket.
4. Push down firmly on the module until it is locked by two latches



5. Replace the cover as described above.

2.3.4 Installing Mini-PCIe Cards

1. Remove the cover from the chassis as described above.
2. Insert the Mini-PCIe card(s) into the slots as shown.



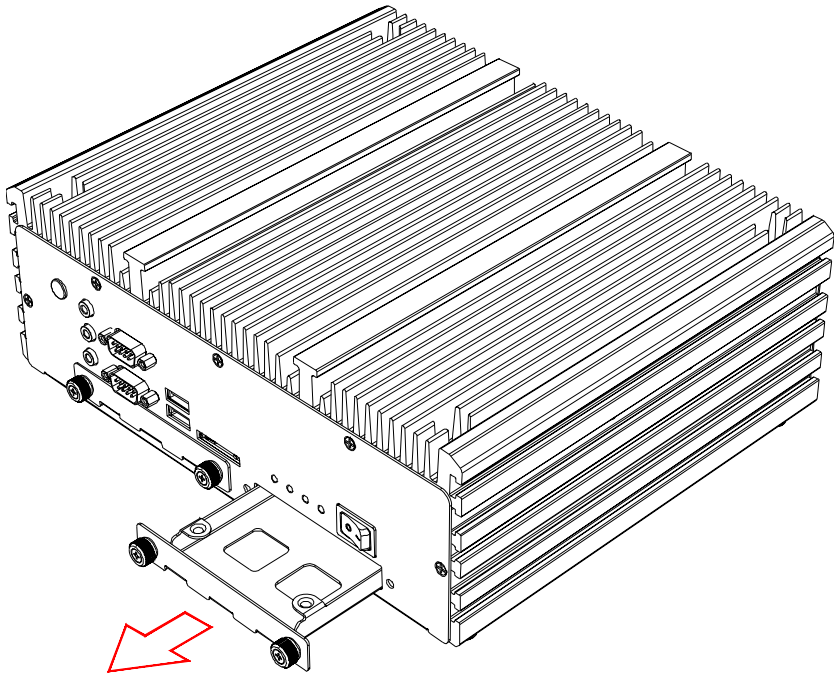
3. Secure with screws and attach antennas as required.
4. Replace the cover as described above.

2.4 Installing a 2.5” SATA Drive

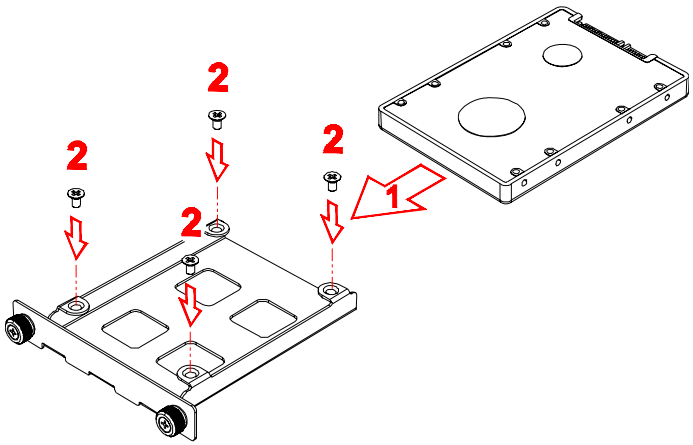
CAUTION:

Before installing or removing a SATA drive, make sure the system has been shut down and the power cord has been unplugged.

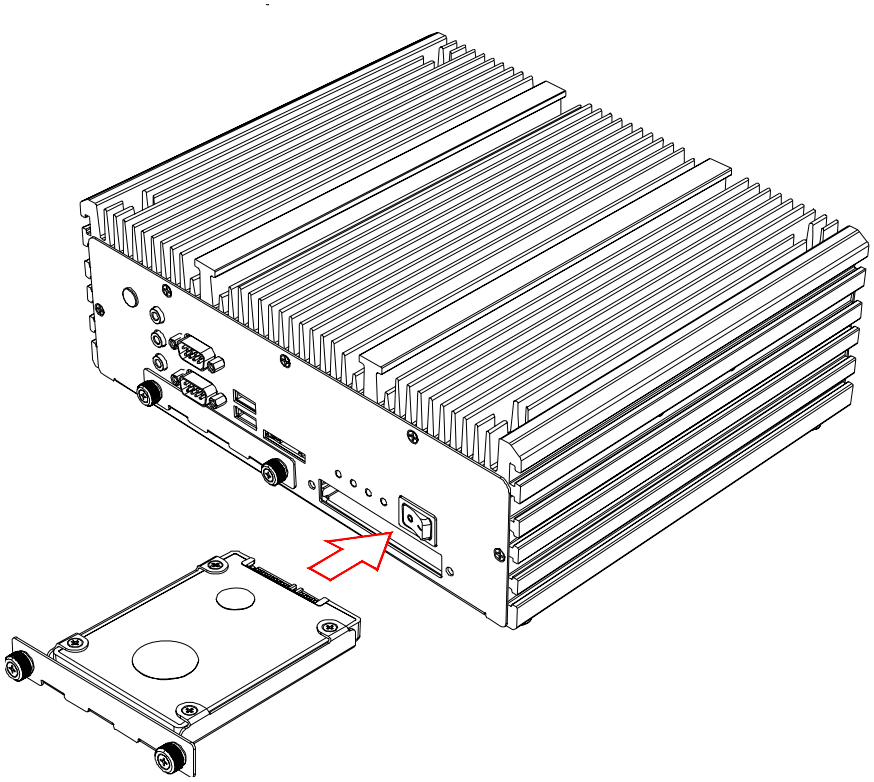
1. Loosen the two large knurled screws securing the drive tray to the front panel of the system and pull the tray out of the chassis.



2. Slide the 2.5” SATA drive into the drive tray with the bottom side facing upwards as shown by arrow “**1**”. Secure the drive to the tray by securing four screws (included in the accessory pack) as indicated by “**2**”.



3. Insert the drive assembly into the chassis and secure it by tightening the two large knurled screws.

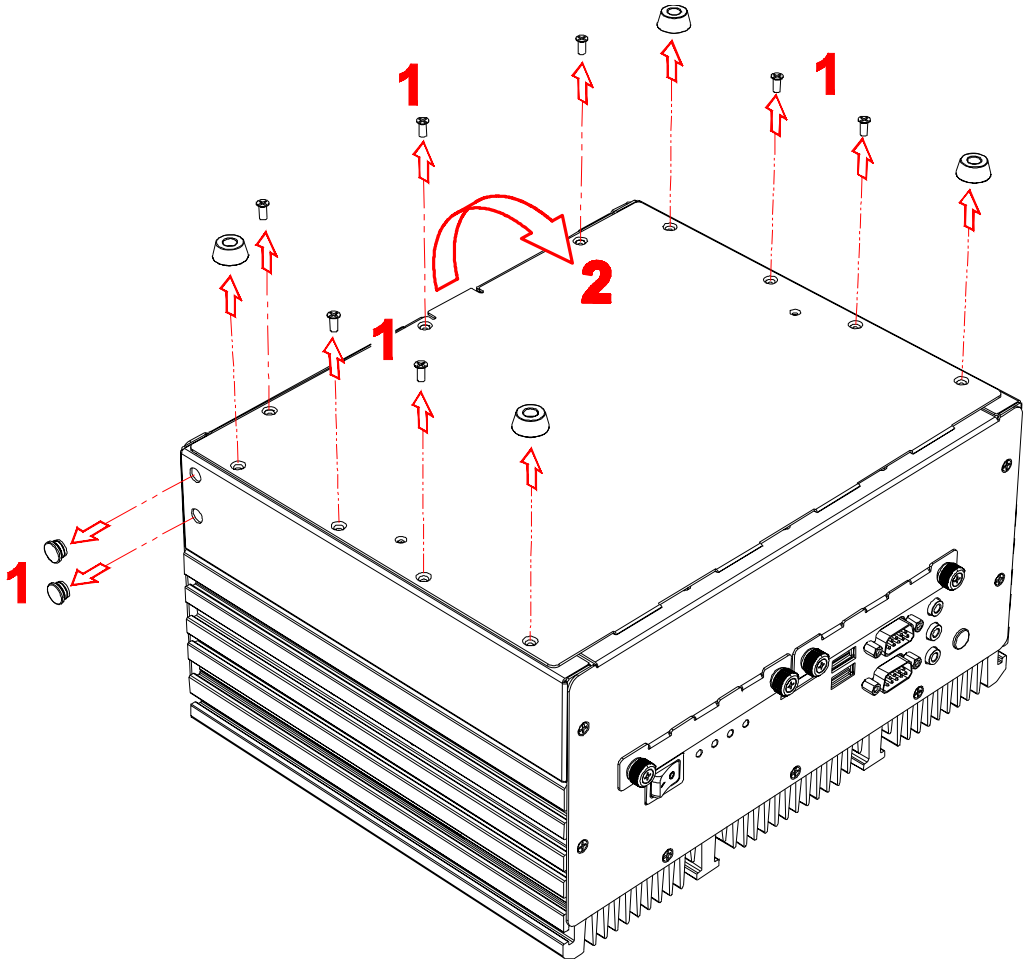


2.5 Installing a PCI/PCIe Expansion Card

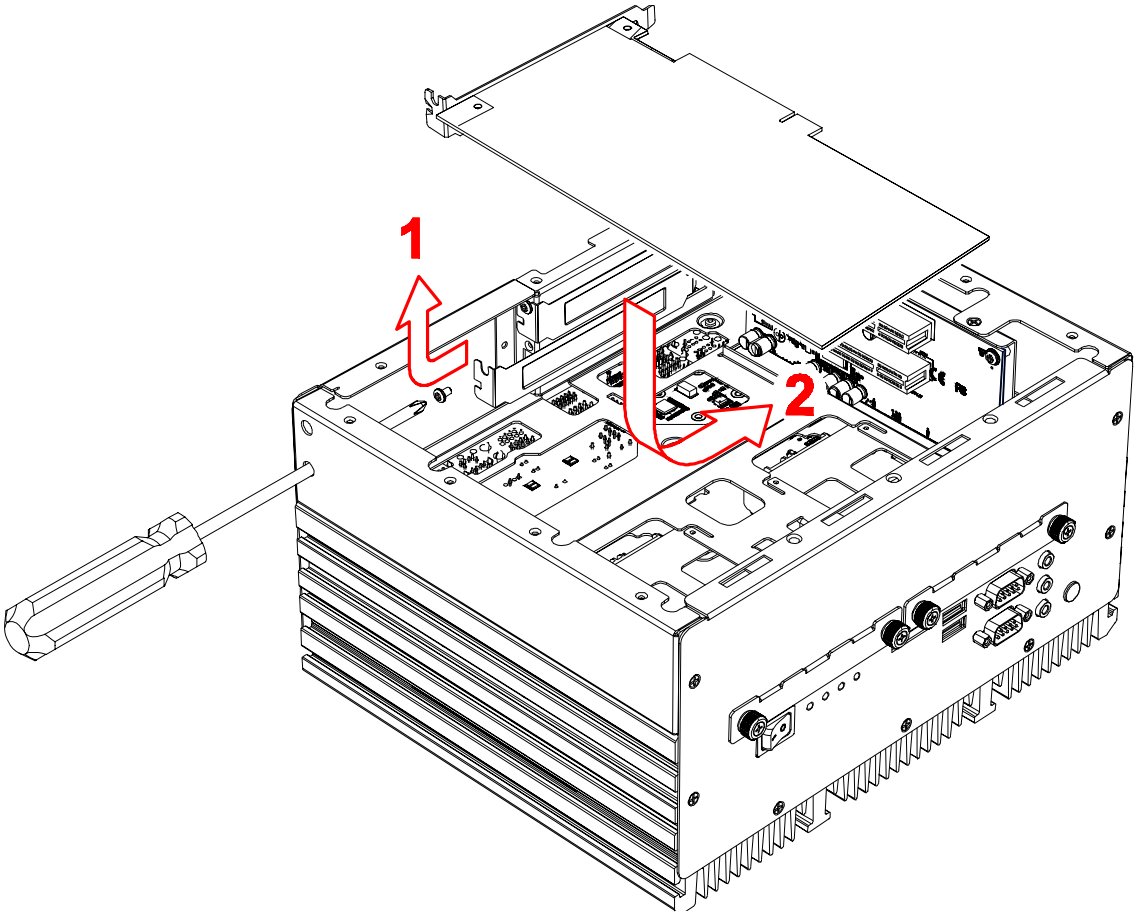
CAUTION:

Before installing or removing a PCI/PCIe expansion card, make sure the system has been shut down and the power cord has been unplugged.

1. Turn the chassis upside down so the bottom is facing upwards. Remove the screws securing the four rubber feet and the seven screws securing the bottom cover of the chassis. Remove the two screws on the side of the chassis.
2. Lift the cover off towards the front panel as shown.



3. Insert a Phillips screwdriver into the hole on the side of the chassis and remove the screw securing the PCI slot blanking plate. Remove the blanking plate as shown by arrow "**1**".
4. Insert the PCI/PCIe expansion card into the slot in the riser card as shown by arrow "**2**".

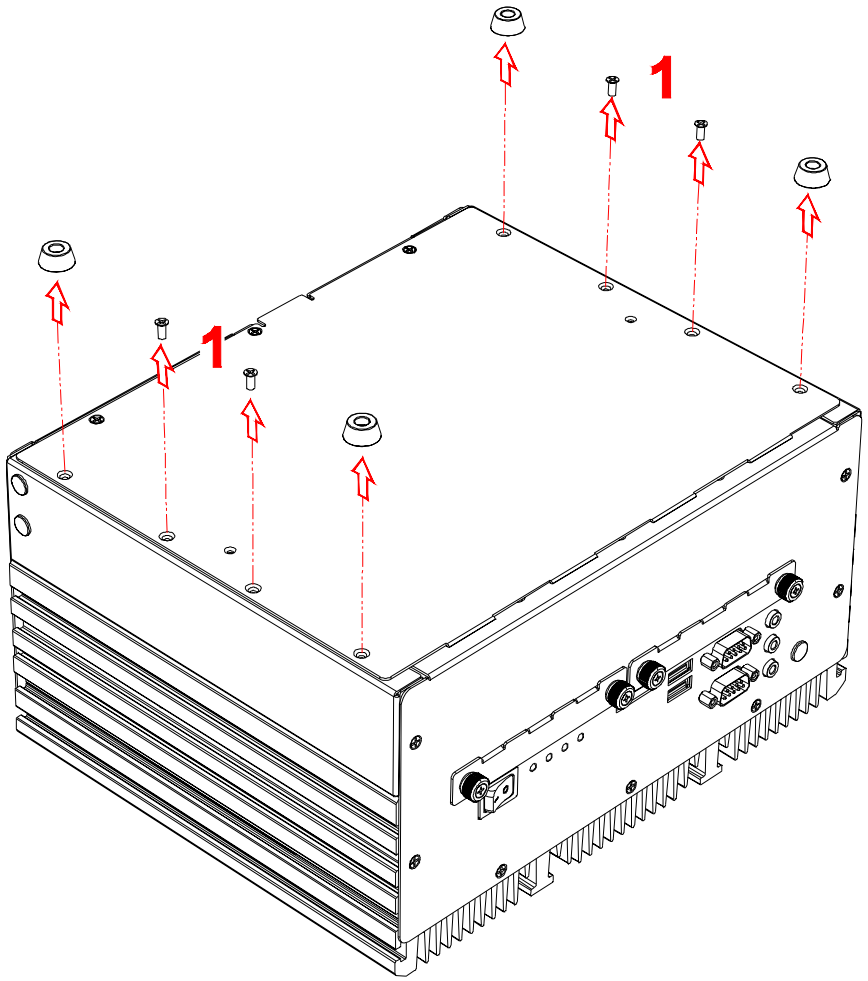


5. Secure the PCI/PCIe expansion card with the screw removed in Step 3 above. Replace the screws on the side of the chassis.
6. Replace the bottom cover of the chassis by reversing Steps 1 and 2 above.

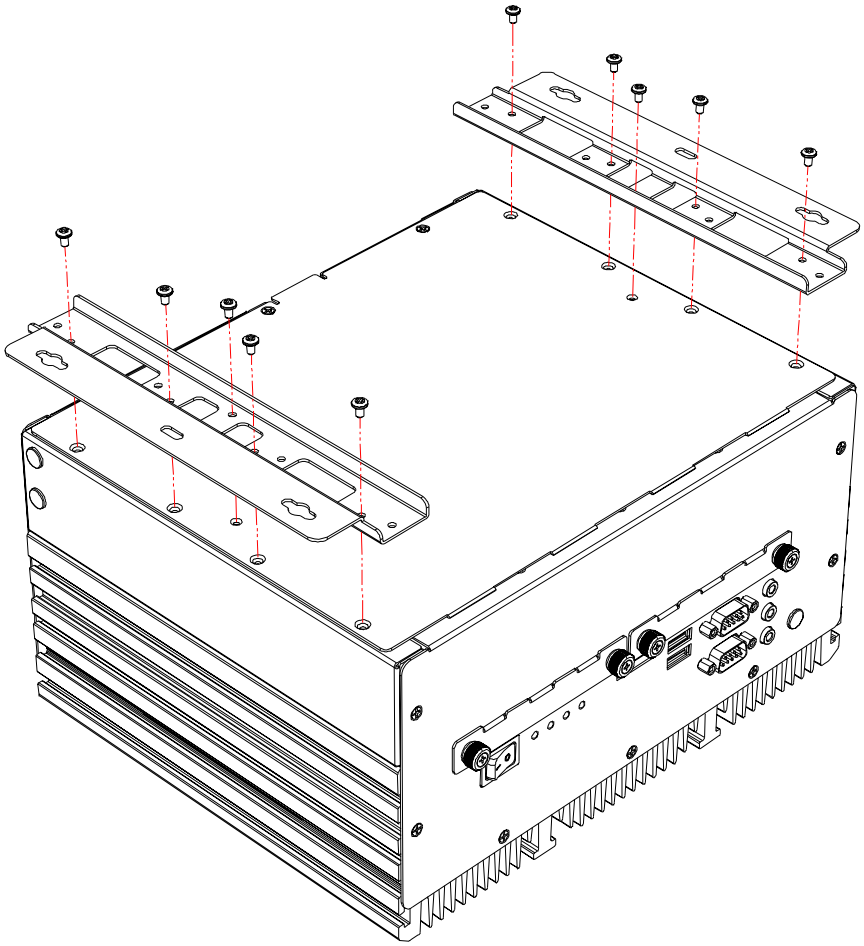
2.6 Installing the Wall Mount Brackets

Optional wall mount brackets are available for the BX-PIB0x and must be ordered separately.

1. Turn the chassis upside down so the bottom is facing upwards. Remove the screws securing the four rubber feet and the four screws on the sides of the bottom cover of the chassis as shown.



2. Install the wall mount brackets to the chassis using the eight screws removed in Step 1, and an additional two screws included in the wall mount bracket kit as shown.



3. Refer to *1.4.3 BX-PIB0x Wall Mount Dimensions* for dimensions of the wall mount bracket mounting holes.

2.7 Driver Installation

The drivers for the BX-PIB0x can be found on the driver DVD included with the system.

Install the following drivers in the order listed.

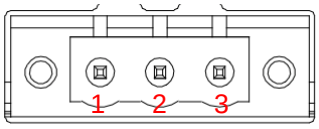
1. Chipset
2. .NET Framework
3. Graphics
4. Audio
5. LAN
6. Management Engine
7. USB 3.0
8. Intel® Rapid Start Technology
9. Intel® Rapid Storage Technology

3. Connectors & Jumpers

3.1 Power Connector

+9V ~ +36V DC wide range power input - 1x3 terminal block connector

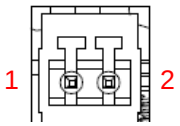
Pin	Signal
1	GND
2	CH_GND_1
3	DC IN



3.2 External Reset Connector

External reset - 1x2 terminal block connector

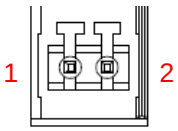
Pin	Signal
1	RESETJ
2	GND



3.3 External Power Switch Connector

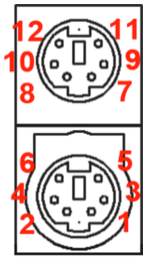
External power switch - 1x2 terminal block connector

Pin	Signal
1	PWRBTNJ
2	GND



3.4 Keyboard & Mouse Connectors

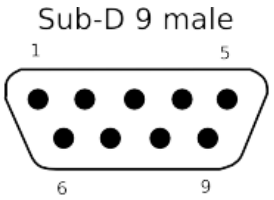
Pin	Signal	Pin	Signal
1	KB_DATA	7	MS_DATA
2	NC	8	NC
3	GND	9	GND
4	+5V	10	+5V
5	KB_CLK	11	MS_CLK
6	NC	12	NC



3.5 COM1-4 (RS-232/422/485, BIOS Selectable)

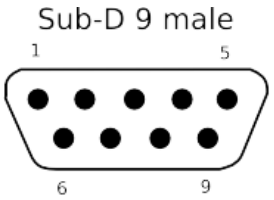
3.5.1 COM1-4 in RS-232 Mode

Pin	Signal	Pin	Signal
1	DCD, Data Carrier Detect	6	DSR, Data Set Ready
2	RXD, Receive Data	7	RTS, Ready To Send
3	TXD, Transmit Data	8	CTS, Clear To Send
4	DTR, Data Terminal Ready	9	RI, Ring Indicator
5	GND, Ground		



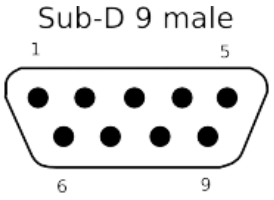
3.5.2 COM1-4 in RS-422 Mode

Pin	Signal	Pin	Signal
1	TXD-, Transmit Data	6	NA
2	RXD+, Receive Data	7	NA
3	TXD+, Transmit Data	8	NA
4	RXD-, Receive Data	9	NA
5	NA		



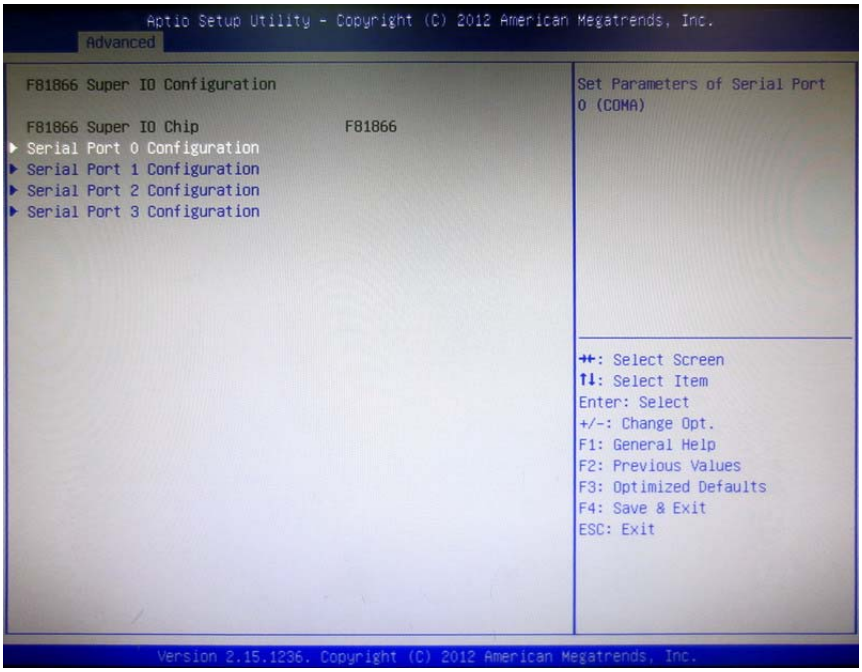
3.5.3 COM1-4 in RS-485 Mode

Pin	Signal	Pin	Signal
1	TXD+, Transmit Data	6	NA
2	TXD-, Transmit Data	7	NA
3	NA	8	NA
4	NA	9	NA
5	NA		

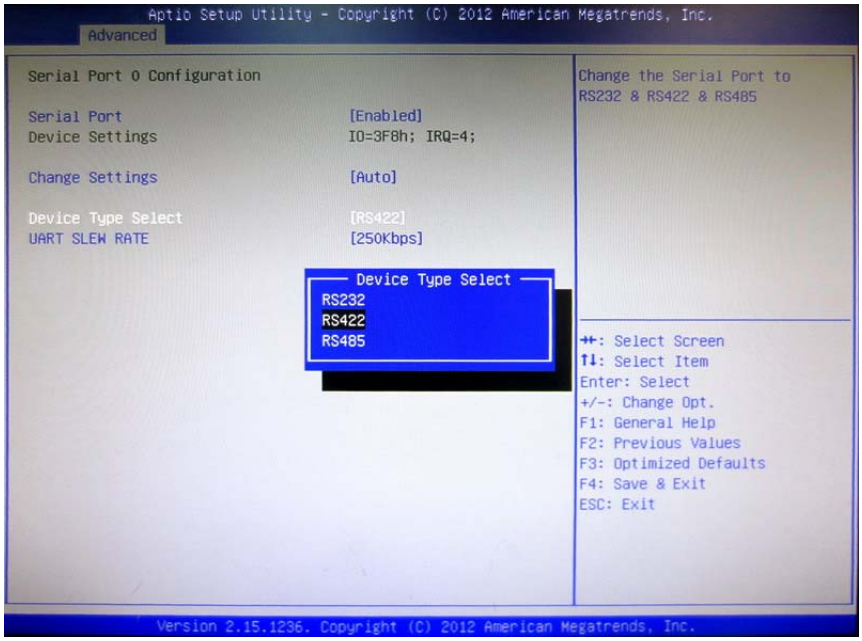


3.5.4 COM1-4 RS-232/422/485 Mode Selection

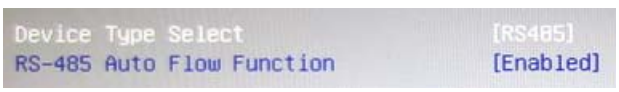
To set the COM mode, boot the system into BIOS Setup Utility and select **Advanced > F81866 Super IO configuration**. You will see the following screen.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
F81866 Super IO Configuration
F81866 Super IO Chip F81866
Serial Port 0 Configuration
Serial Port 1 Configuration
Serial Port 2 Configuration
Serial Port 3 Configuration
Set Parameters of Serial Port 0 (COMA)
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

Select the COM port you wish to setup and choose from RS-232, RS-422 and RS-485.



If RS-485 is selected, you can enable/disable the RS-485 Auto Flow Function which automatically handles half-duplex control.

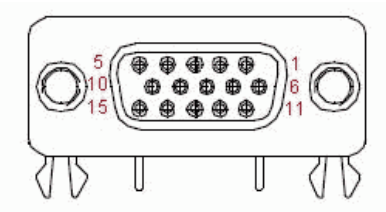


Save the configuration and exit the BIOS Setup Utility ("F4" hotkey).

3.6 VGA Connector

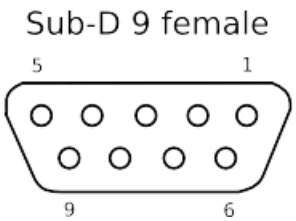
15-pin D-sub Female Connector

Pin	Signal	Pin	Signal
1	VGA_RED	9	VCC
2	VGA_GRN	10	GND
3	VGA_BLU	11	NC
4	NC	12	VGA_DDC_DAT
5	GND	13	VGA_HSYNC
6	GND	14	VGA_VSYNC
7	GND	15	VGA_DCC_CLK
8	GND		



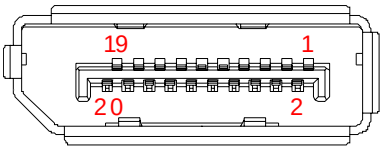
3.7 GPIO Connector

Pin	Signal	Pin	Signal
1	DIO_PH_IN0	6	DIO_PH_OUT0
2	DIO_PH_IN1	7	DIO_PH_OUT1
3	DIO_PH_IN2	8	DIO_PH_OUT2
4	DIO_PH_IN3	9	DIO_PH_OUT3
5	5V & 12V		



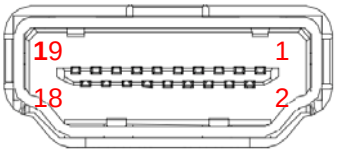
3.8 DisplayPort Connector

Pin	Signal	Pin	Signal
1	CN_DP0_P	2	Ground
3	CN_DP0_N	4	CN_DP1_P
5	Ground	6	CN_DP1_N
7	CN_DP2_P	8	Ground
9	CN_DP2_N	10	CN_DP3_P
11	Ground	12	CN_DP3_N
13	CN_CAD-L	14	CN_CEC
15	CN_AUX_P	16	Ground
17	CN_AUX_N	18	DDP_HPD
19	Ground	20	P3V3



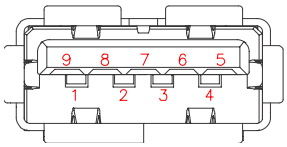
3.9 HDMI Connector

Pin	Signal	Pin	Signal
1	HDMI_TX2_DP_B	2	GND
3	HDMI_TX2_DN_B	4	HDMI_TX1_DP_B
5	GND	6	HDMI_TX1_DN_B
7	HDMI_TX0_DP_B	8	GND
9	HDMI_TX0_DN_B	10	HDMI_CLK_DP_B
11	GND	12	HDMI_CLK_DN_B
13	NC	14	NC
15	HDMI_SCLDDC_B	16	HDMI_SDADDC_B
17	GND	18	+5V



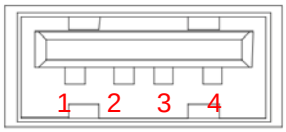
3.10 USB 3.0 Connectors

Pin	Signal	Pin	Signal
1	USB +5V	5	USB_SSRX-
2	USB_D-	6	USB_SSRX+
3	USB_D+	7	GND_DRAIN
4	GND	8	USB_SSTX-
		9	USB_SSTX+



3.11 USB 2.0 Connectors

Pin	Signal
1	USB +5V
2	USB_D-
3	USB_D+
4	GND

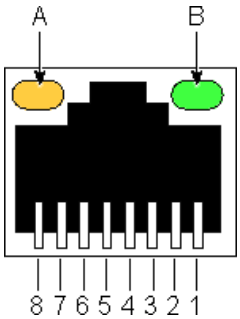


3.12 Front Audio Jacks

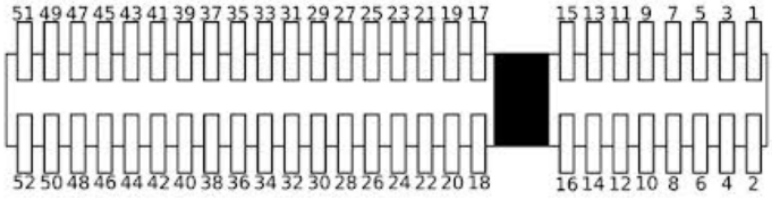
Pin	Signal
Blue	Line-In
Green	Line-Out
Pink	Mic-In

3.13 LAN Connectors

Pin	Signal	Pin	Signal
1	MDI0+	5	MDI2-
2	MDI0-	6	MDI1-
3	MDI1+	7	MDI3+
4	MDI2+	8	MDI3-
A	Active LED (Yellow)	B	10 LAN LED (OFF) 100 LAN LED (Green) 1000 LAN LED (Orange)



3.14 Mini-PCIe Connectors



3.14.1 Mini-PCIe (CN22)

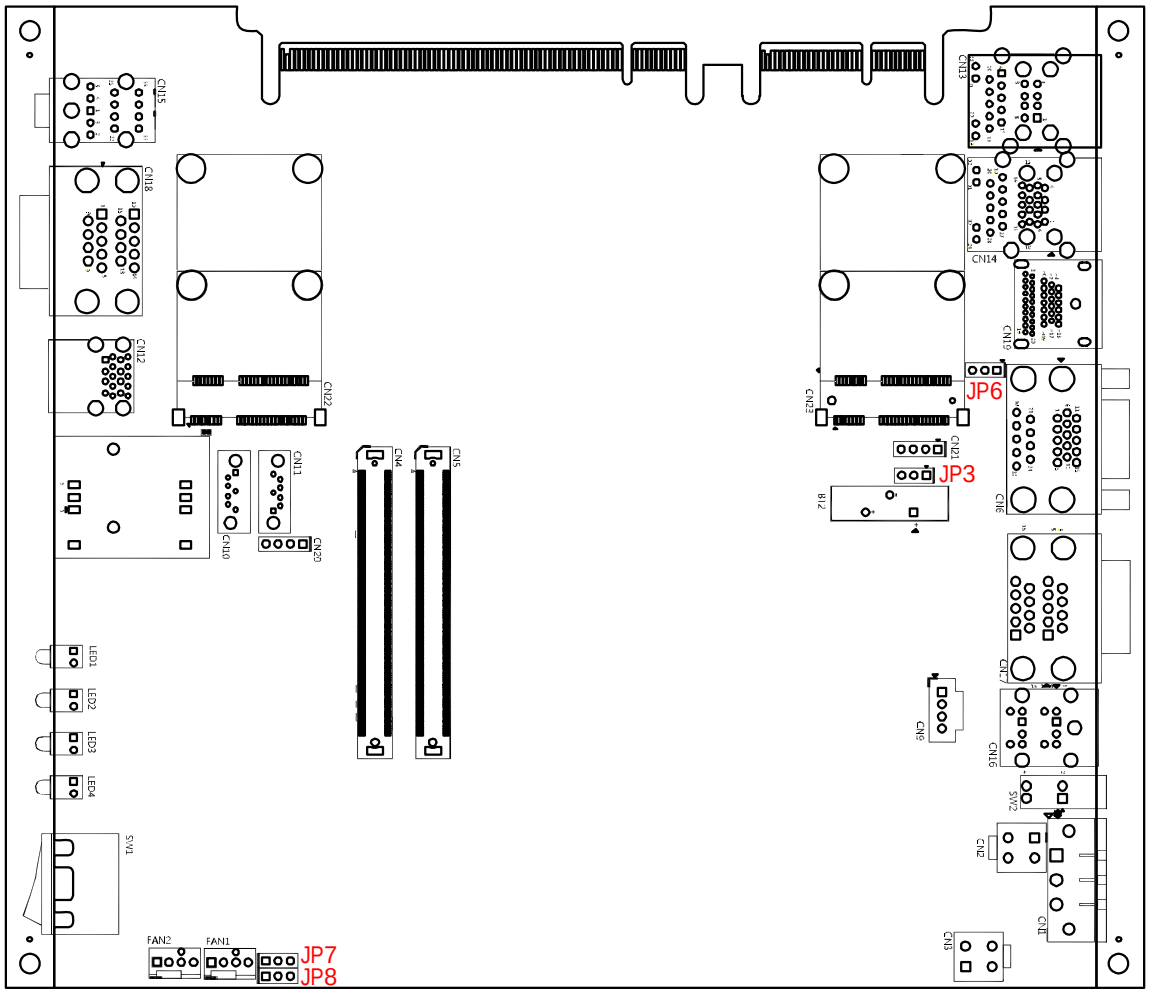
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	WAKE0J	15	GND	29	GND	43	N/A
2	+3.3V	16	N/A	30	SMB_CLK	44	LED_WLANJ
3	N/A	17	N/A	31	PCIE4_TXN	45	N/A
4	GND	18	GND	32	SMB_DAT	46	LED_WPANJ
5	N/A	19	N/A	33	PCIE4_TXP	47	N/A
6	+1.5V	20	N/A	34	GND	48	+1.5V
7	P3V3	21	GND	35	GND	49	N/A
8	N/A	22	MINI_RST	36	USB6N	50	GND
9	GND	23	PCIE4_RXN	37	N/A	51	N/A
10	N/A	24	3V3SB	38	USB6P	52	+3.3V
11	PCIE0_CLK_N	25	PCIE4_RXP	39	N/A		
12	N/A	26	GND	40	GND		
13	PCIE0_CLK_P	27	GND	41	N/A		
14	N/A	28	+1.5V	42	LED_WWANJ		

3.14.2 Mini-PCIe (CN23)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	WAKE0J	15	GND	29	GND	43	N/A
2	+3.3V	16	UIM_VPP	30	SMB_CLK	44	P3V3
3	N/A	17	N/A	31	PCIE5_TXN	45	N/A
4	GND	18	GND	32	SMB_DAT	46	N/A
5	N/A	19	N/A	33	PCIE5_TXP	47	N/A
6	+1.5V	20	N/A	34	GND	48	+1.5V
7	P3V3	21	GND	35	GND	49	N/A
8	UIM_PWR	22	MINI_RST	36	USB7N	50	GND
9	GND	23	PCIE5_RXN	37	N/A	51	N/A
10	UIM_DATA	24	3V3	38	USB7P	52	+3.3V
11	PCIE2_CLK_N	25	PCIE5_RXP	39	N/A		
12	UIM_CLK	26	GND	40	GND		
13	PCIE2_CLK_P	27	GND	41	N/A		
14	UIM_RST	28	+1.5V	42	N/A		

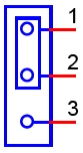
3.15 Jumpers

3.15.1 Jumper Locations



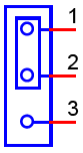
3.15.2 Clear CMOS (JP3)

JP3	Function
1-2	Normal (default)
2-3	Clear CMOS



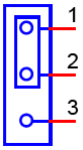
3.15.3 GPIO Output (JP6)

JP6	Function
1-2	5V (default)
2-3	12V



3.15.4 BIOS Module Selection (JP7, JP8)

JP7 (BIOS_DIS0#)	JP8 (BIOS_DIS1#)	Function
1-2	1-2	Module SPI (default)
2-3	1-2	N/A
1-2	2-3	Carrier SPI
2-3	2-3	Module SPI 1



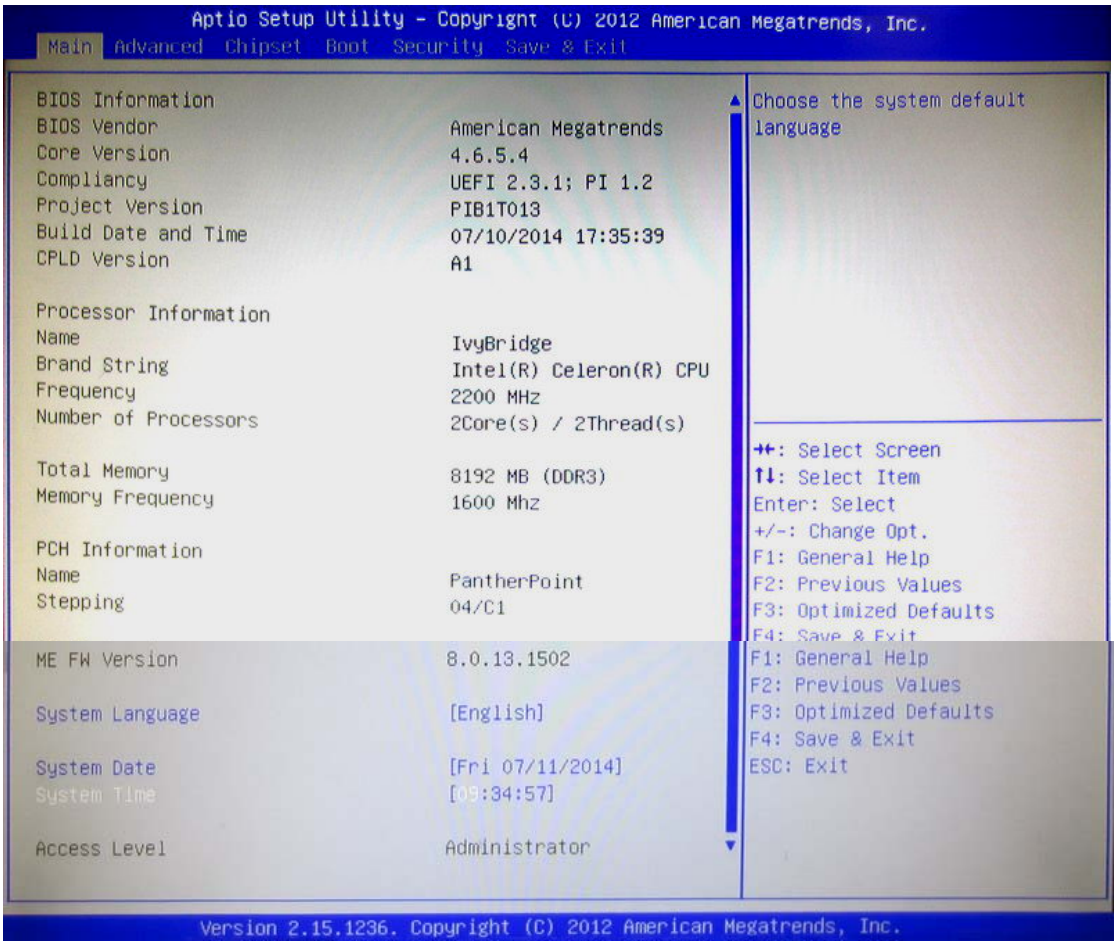
4. System BIOS

The system BIOS software is stored on EEPROM. The BIOS provides an interface to modify the configuration. When the battery is removed, all the parameters will be reset.

Turn on the computer and press <DEL> or <F2> to enter the setup screens.

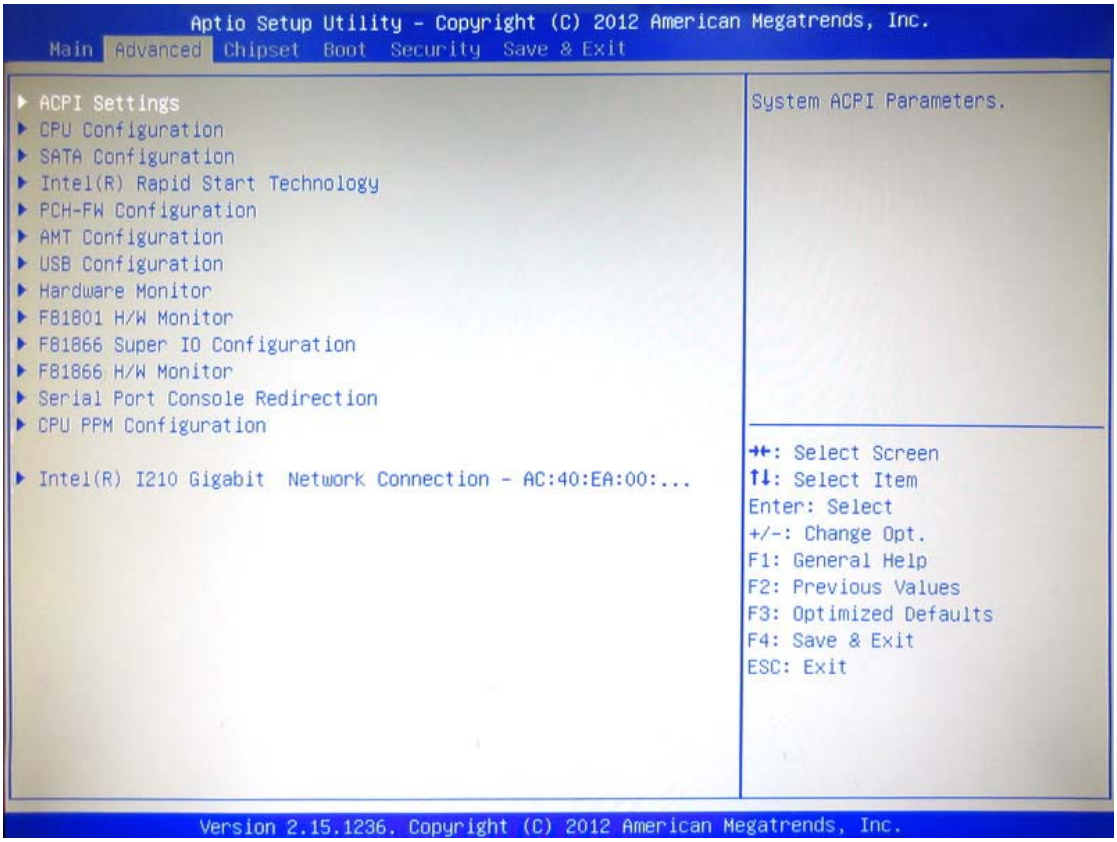
4.1 Main

The Main setup screen is showed as following when the setup utility is entered. System Date/Time is set up in the Main Menu.

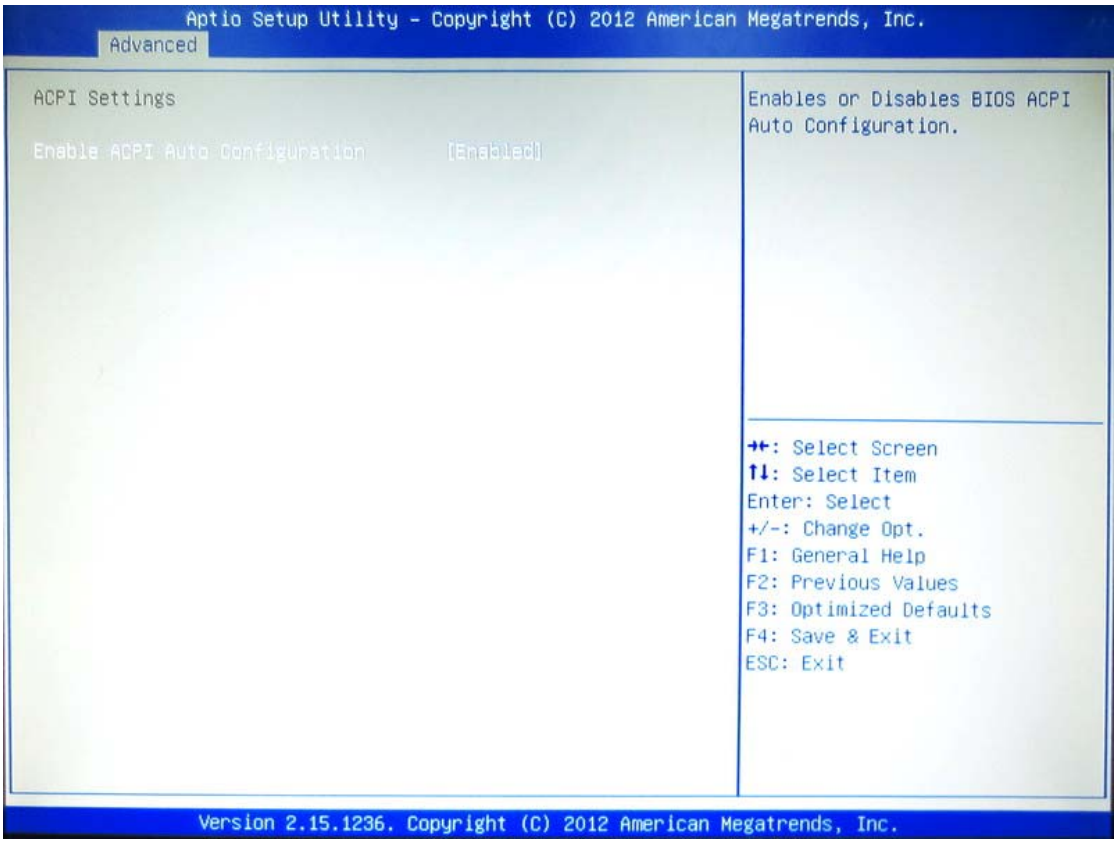


System Date: MM/DD/YYYY
System Time: HH:MM:SS
Use Tab to switch between Date and Time elements.

4.2 Advanced

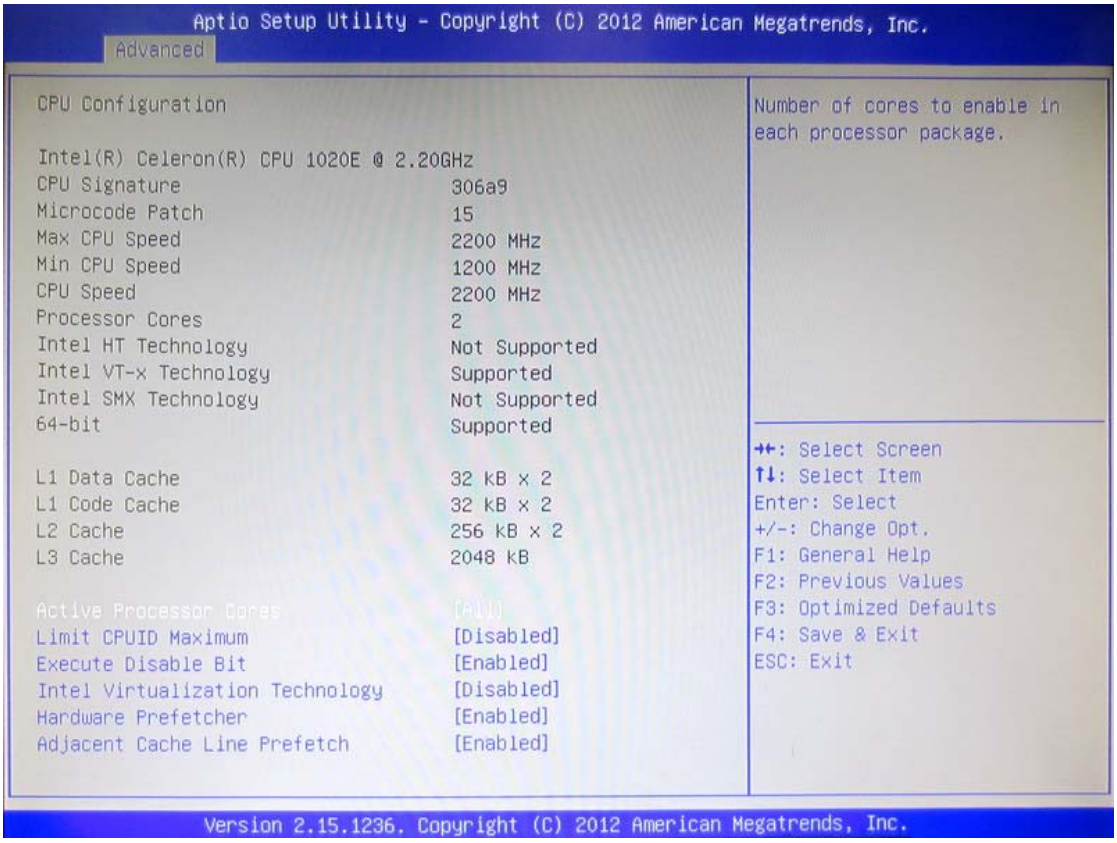

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
ACPI Settings
CPU Configuration
SATA Configuration
Intel(R) Rapid Start Technology
PCH-FW Configuration
AMT Configuration
USB Configuration
Hardware Monitor
F81801 H/W Monitor
F81866 Super IO Configuration
F81866 H/W Monitor
Serial Port Console Redirection
CPU PPM Configuration
Intel(R) I210 Gigabit Network Connection - AC:40:EA:00:...
System ACPI Parameters.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

4.2.1 ACPI Settings



Enable ACPI Auto Configuration: Enables or disables BIOS ACPI Auto Configuration.

4.2.2 CPU Configuration

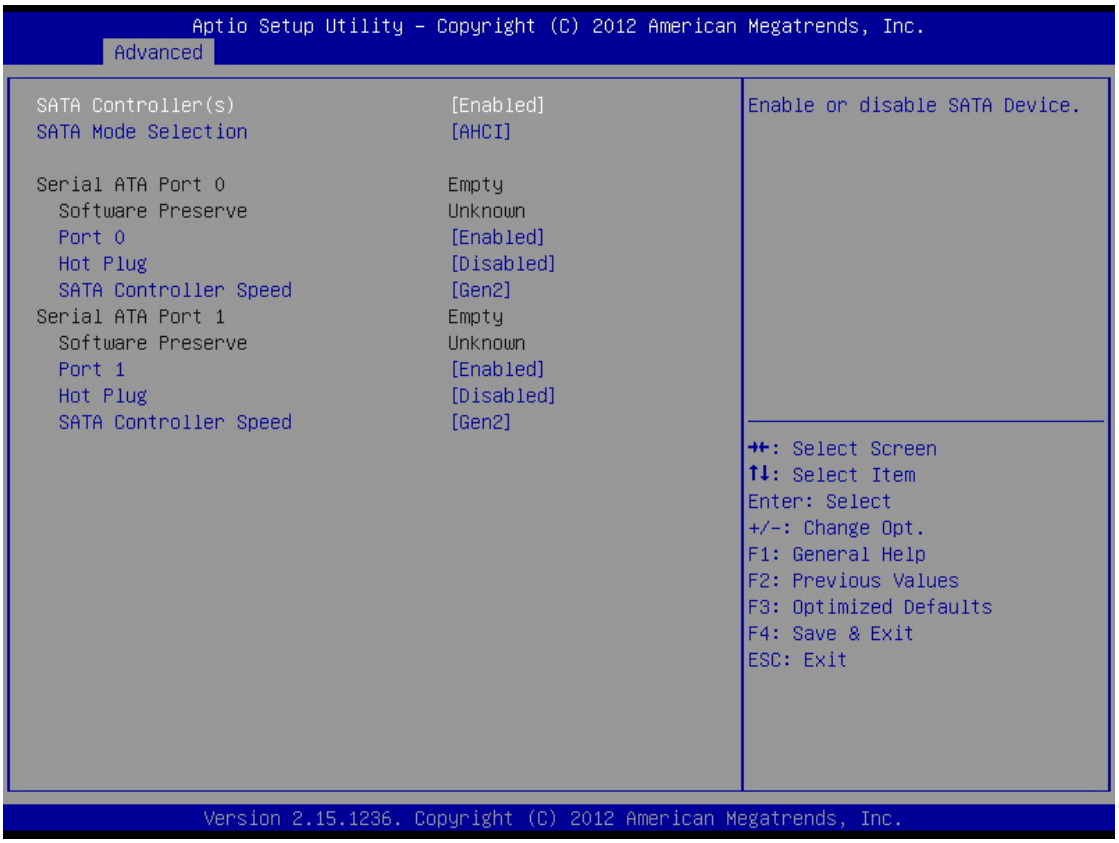

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
CPU Configuration
Intel(R) Celeron(R) CPU 1020E @ 2.20GHz
CPU Signature 306a9
Microcode Patch 15
Max CPU Speed 2200 MHz
Min CPU Speed 1200 MHz
CPU Speed 2200 MHz
Processor Cores 2
Intel HT Technology Not Supported
Intel VT-x Technology Supported
Intel SMX Technology Not Supported
64-bit Supported
L1 Data Cache 32 kB x 2
L1 Code Cache 32 kB x 2
L2 Cache 256 kB x 2
L3 Cache 2048 kB
Active Processor Cores [All]
Limit CPUID Maximum [Disabled]
Execute Disable Bit [Enabled]
Intel Virtualization Technology [Disabled]
Hardware Prefetcher [Enabled]
Adjacent Cache Line Prefetch [Enabled]
Number of cores to enable in each processor package.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

Limit CPUID Maximum: Disabled for Windows XP.

Execute Disable Bit: XP can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SusE Linux 9.2, RedHat Enterprise 3 Update 3.)

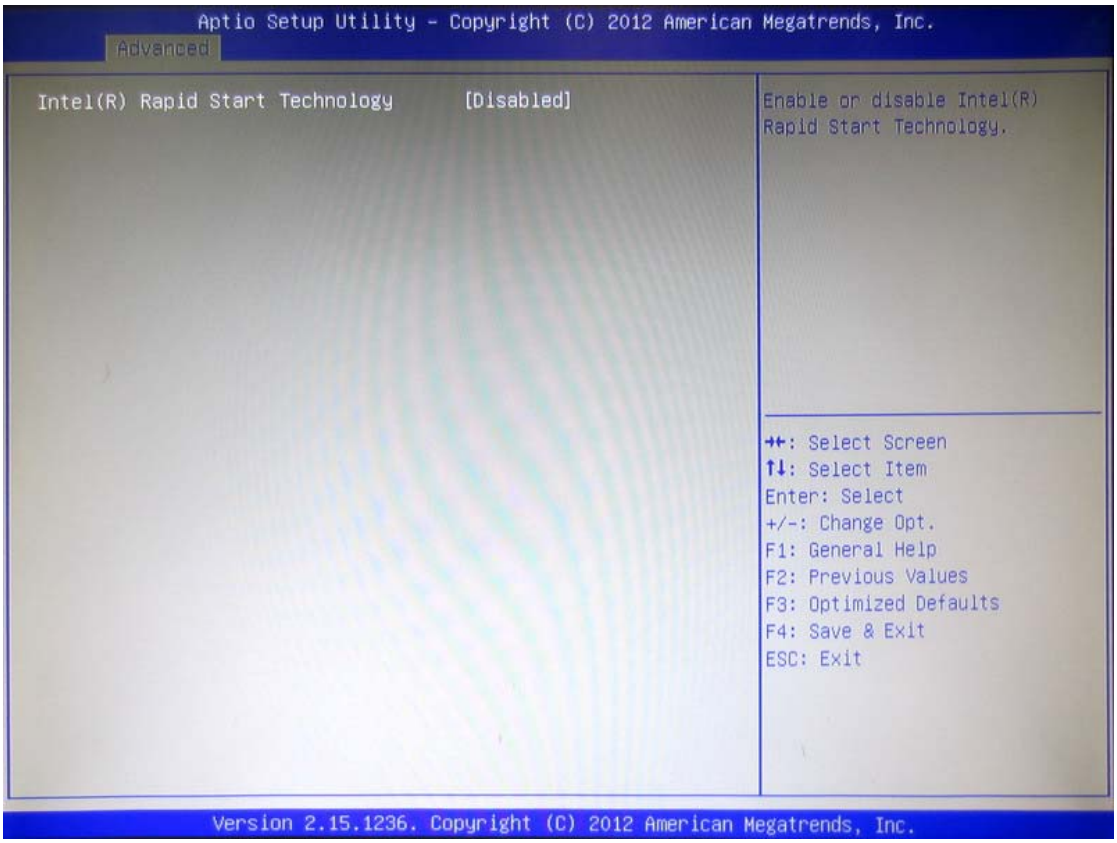
4.2.3 SATA Configuration

The BIOS automatically detects the presence of SATA device and the hardware installed in the SATA ports will be showed in the configuration. Each port can be enabled or disabled individually.



Hot Plug: Designates this port as Hot Pluggable.
SATA Controller Speed: Options: Gen 1, Gen 2.

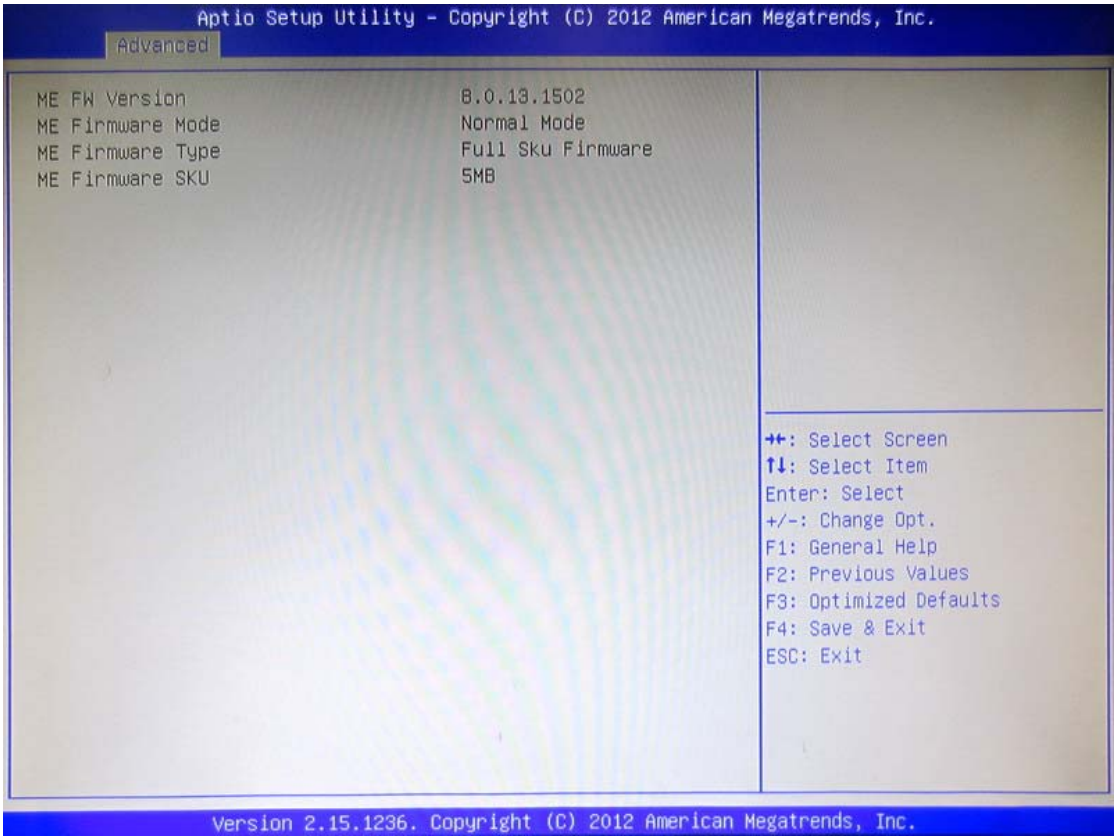
4.2.4 Intel Rapid Start Technology


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Intel(R) Rapid Start Technology [Disabled]
Enable or disable Intel(R) Rapid Start Technology.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

Intel Rapid Start Technology: Enables or disables Intel Rapid Start Technology.

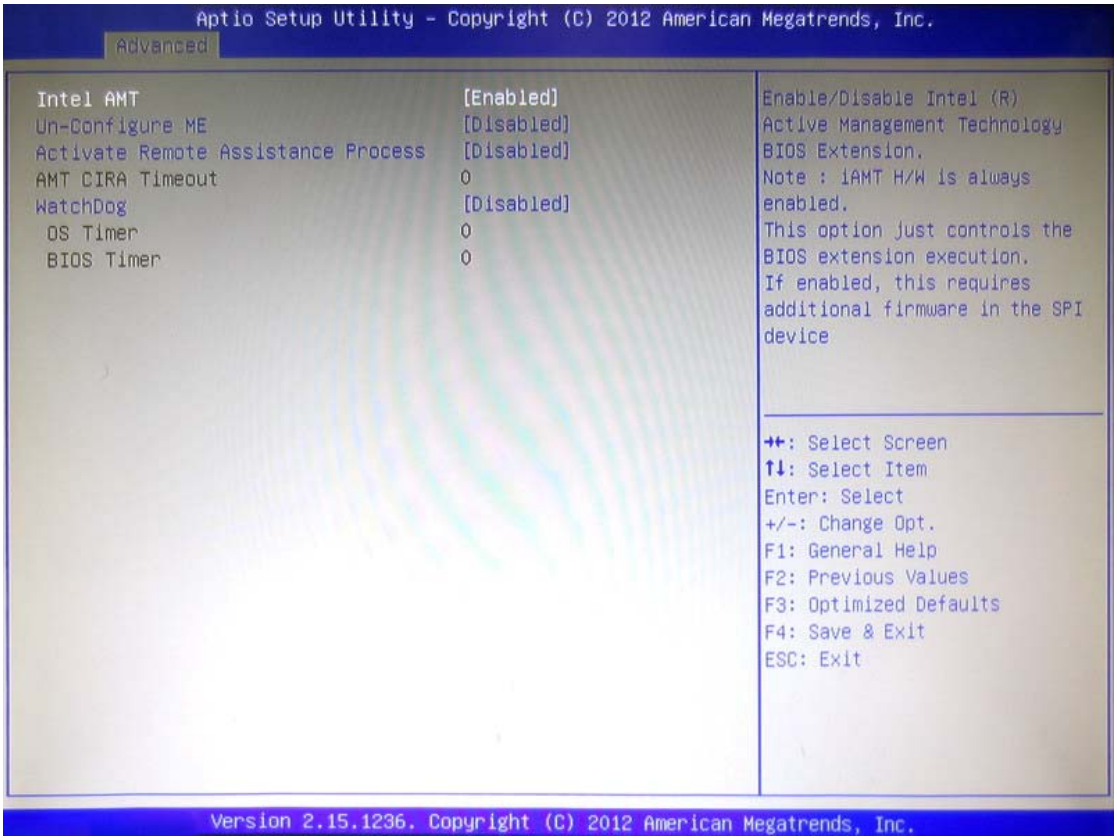
4.2.5 PCH-FW Configuration

Displays the firmware information.

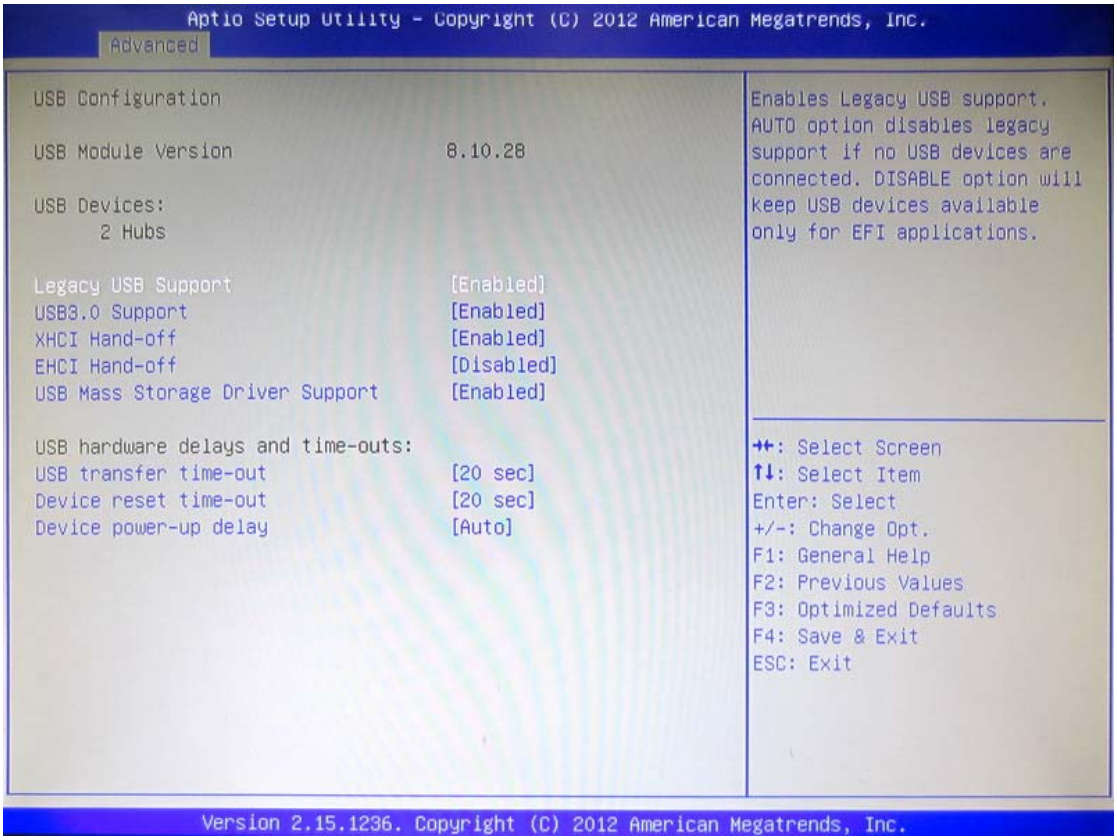


4.2.6 AMT Configuration

Enable/disable and configure Intel AMT.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Intel AMT [Enabled]
Un-Configure ME [Disabled]
Activate Remote Assistance Process [Disabled]
AMT CIRA Timeout 0
WatchDog [Disabled]
OS Timer 0
BIOS Timer 0
Enable/Disable Intel (R) Active Management Technology BIOS Extension.
Note : iAMT H/W is always enabled.
This option just controls the BIOS extension execution.
If enabled, this requires additional firmware in the SPI device
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

4.2.7 USB Configuration


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
USB Configuration
USB Module Version 8.10.28
USB Devices:
2 Hubs
Legacy USB Support [Enabled]
USB3.0 Support [Enabled]
XHCI Hand-off [Enabled]
EHCI Hand-off [Disabled]
USB Mass Storage Driver Support [Enabled]
USB hardware delays and time-outs:
USB transfer time-out [20 sec]
Device reset time-out [20 sec]
Device power-up delay [Auto]
Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

Legacy USB Support: Auto option disables legacy support if no USB devices are connected. Disable option will keep USB devices available only for EFI applications.

USB 3.0 Support: Enable/disable USB 3.0.

XHCI Hand-off: This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

EHCI Hand-off: This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

USB Mass Storage Driver Support: Enable/Disable USB Mass Storage Driver Support.

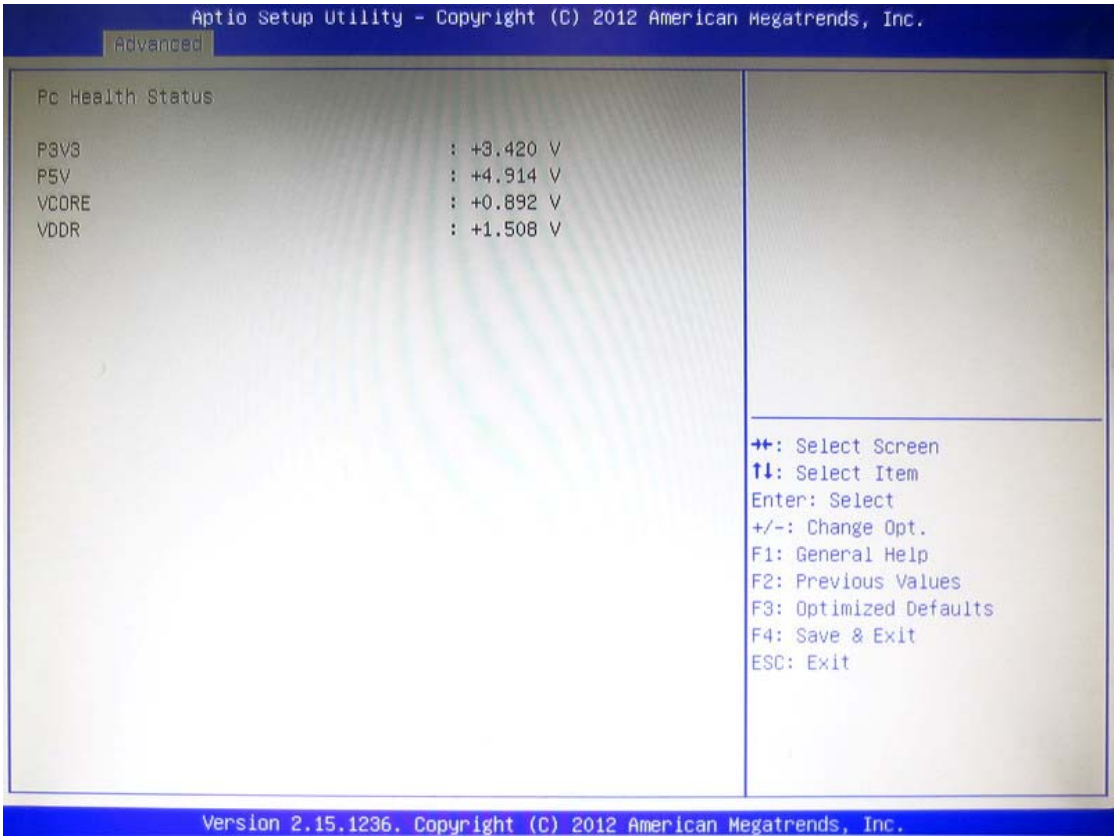
USB transfer time-out: The time-out value for Control, Bulk, and Interrupt transfers.

Device reset time-out: USB mass storage device Start Unit command time-out.

Device power-up delay: Maximum time the device will take before it properly reports itself to the Host Controller. “Auto” uses default value: for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.

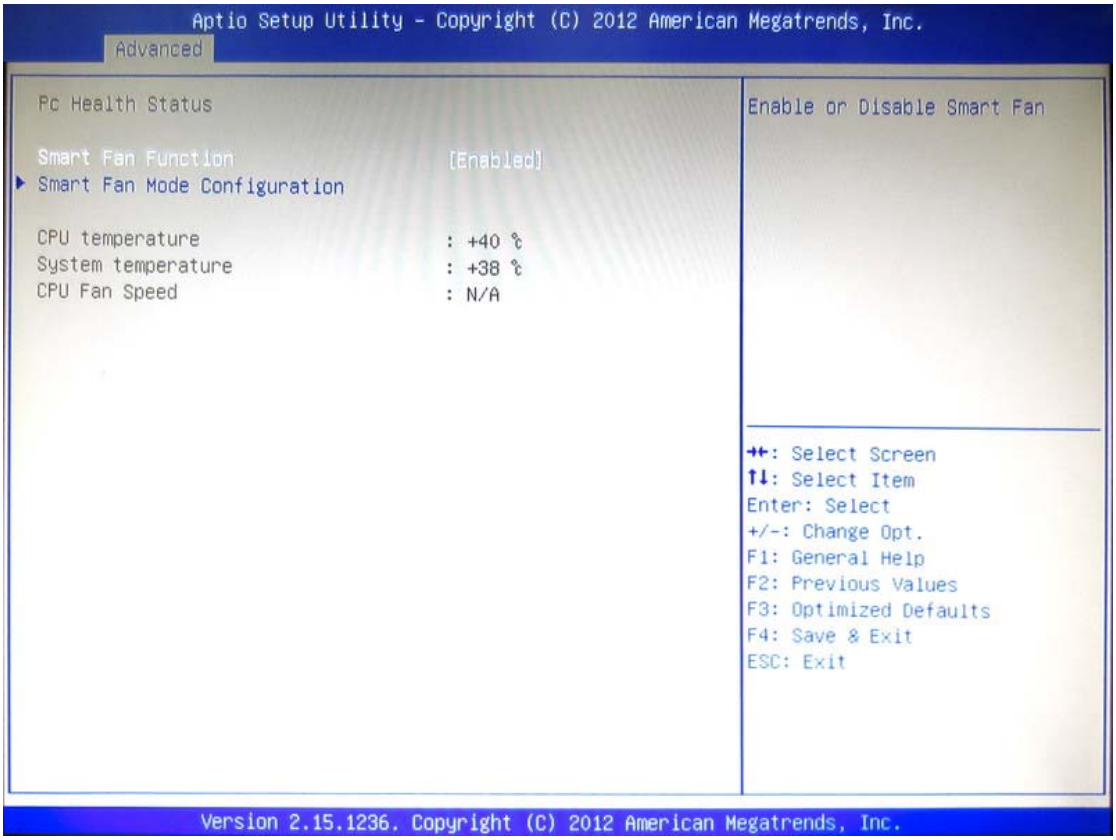
4.2.8 Hardware Monitor

CPU and memory health status information.

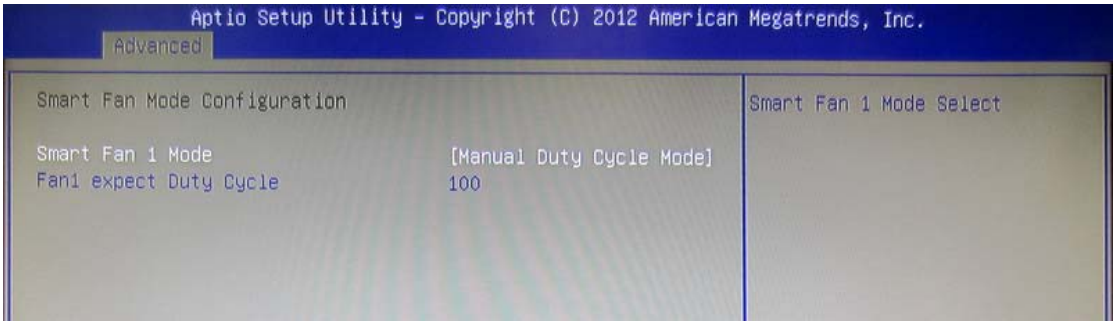


4.2.9 F81801 H/W Monitor

Smart Fan Function: Enable/disable Smart Fan.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Pc Health Status
Smart Fan Function [Enabled]
Smart Fan Mode Configuration
CPU temperature : +40 °C
System temperature : +38 °C
CPU Fan Speed : N/A
Enable or Disable Smart Fan
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

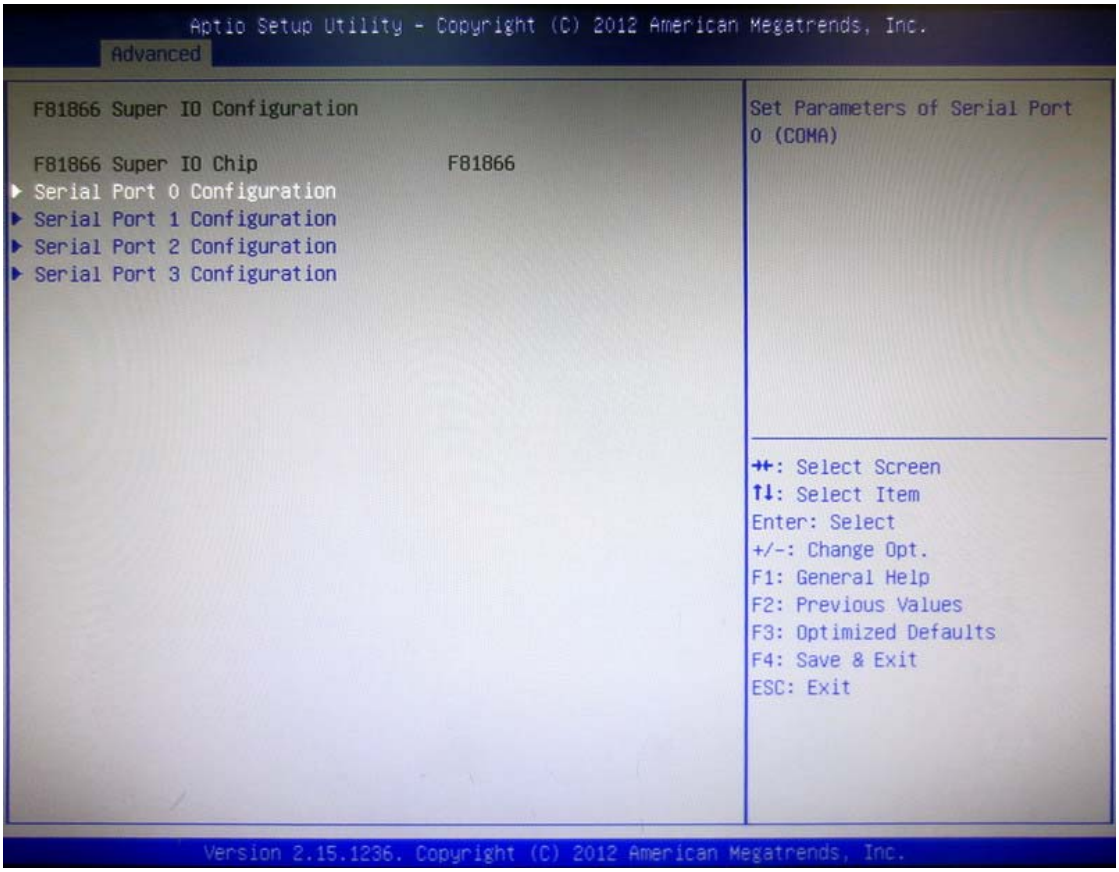
4.2.9.1 Smart Fan Configuration


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Smart Fan Mode Configuration
Smart Fan 1 Mode [Manual Duty Cycle Mode]
Fan1 expect Duty Cycle 100
Smart Fan 1 Mode Select

Smart Fan 1 Mode: Select CPU Smart Fan 1 Mode.

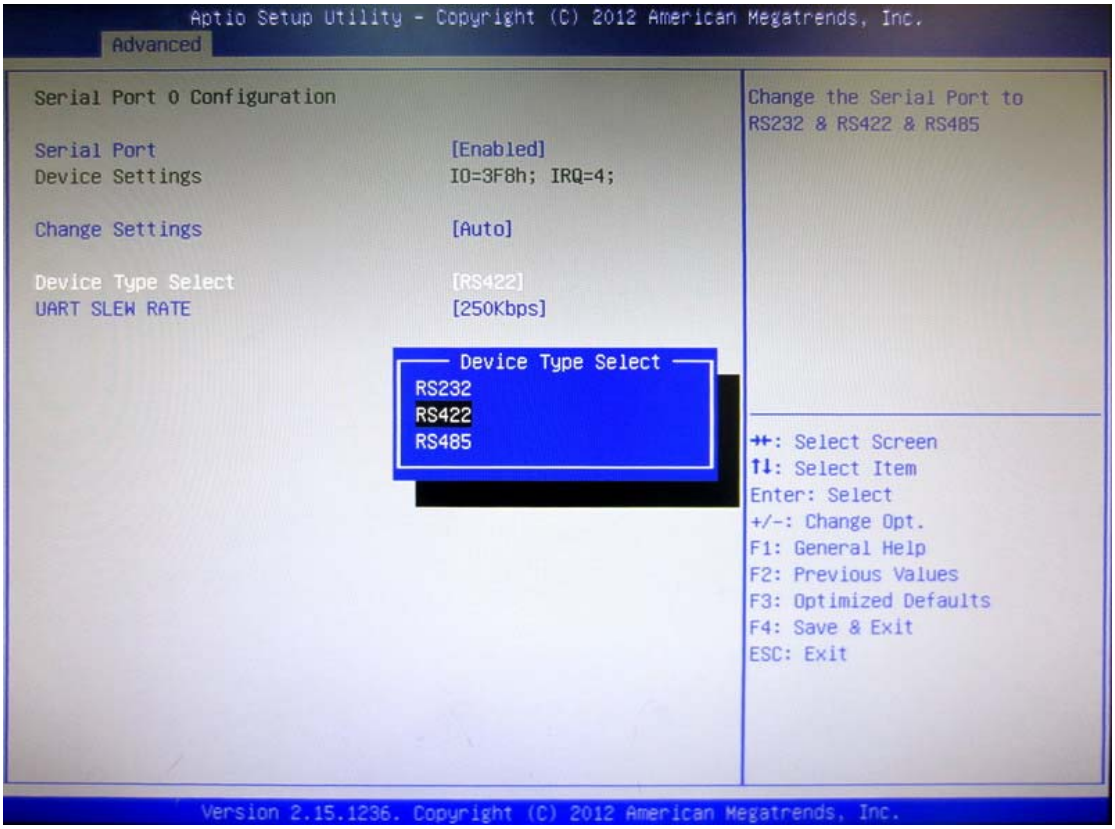
4.2.10 F81866 Super IO Configuration

Enable/disable and configure the serial ports.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
F81866 Super IO Configuration
F81866 Super IO Chip F81866
Serial Port 0 Configuration
Serial Port 1 Configuration
Serial Port 2 Configuration
Serial Port 3 Configuration
Set Parameters of Serial Port 0 (COMA)
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

4.2.10.1 Serial Port Configuration

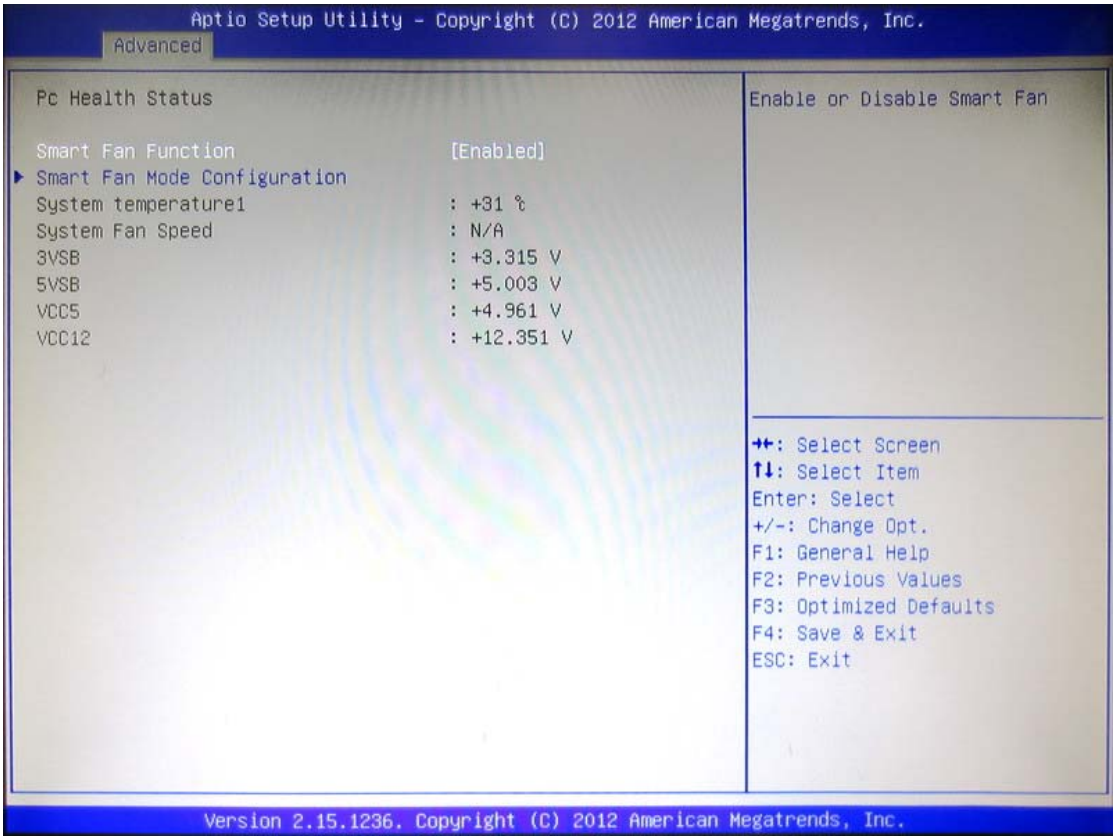
Select the COM port you wish to setup and choose from RS-232, RS-422 and RS-485.



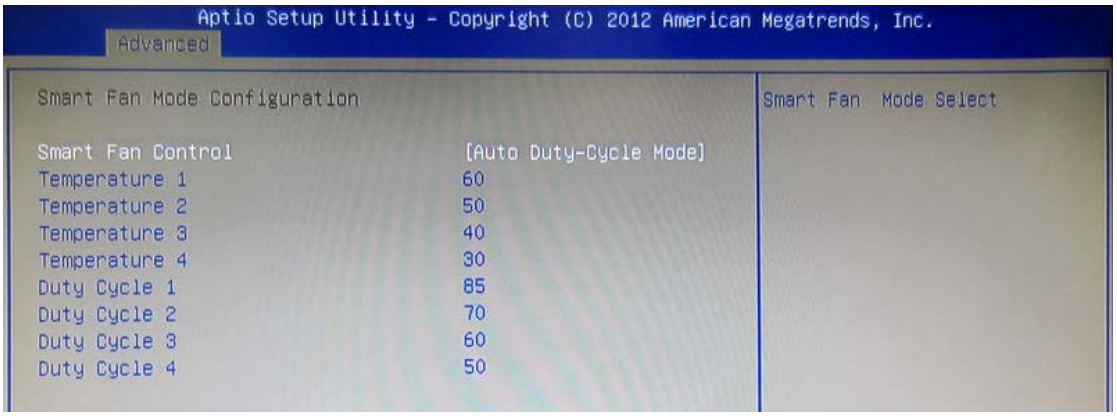
If RS-485 is selected, you can enable/disable the RS-485 Auto Flow Function which automatically handles half-duplex control.

4.2.11 F81866 H/W Monitor

System health information and Smart Fan configuration.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Pc Health Status
Smart Fan Function [Enabled]
Smart Fan Mode Configuration
System temperature1 : +31 %
System Fan Speed : N/A
3VSB : +3.315 V
5VSB : +5.003 V
VCC5 : +4.961 V
VCC12 : +12.351 V
Enable or Disable Smart Fan
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

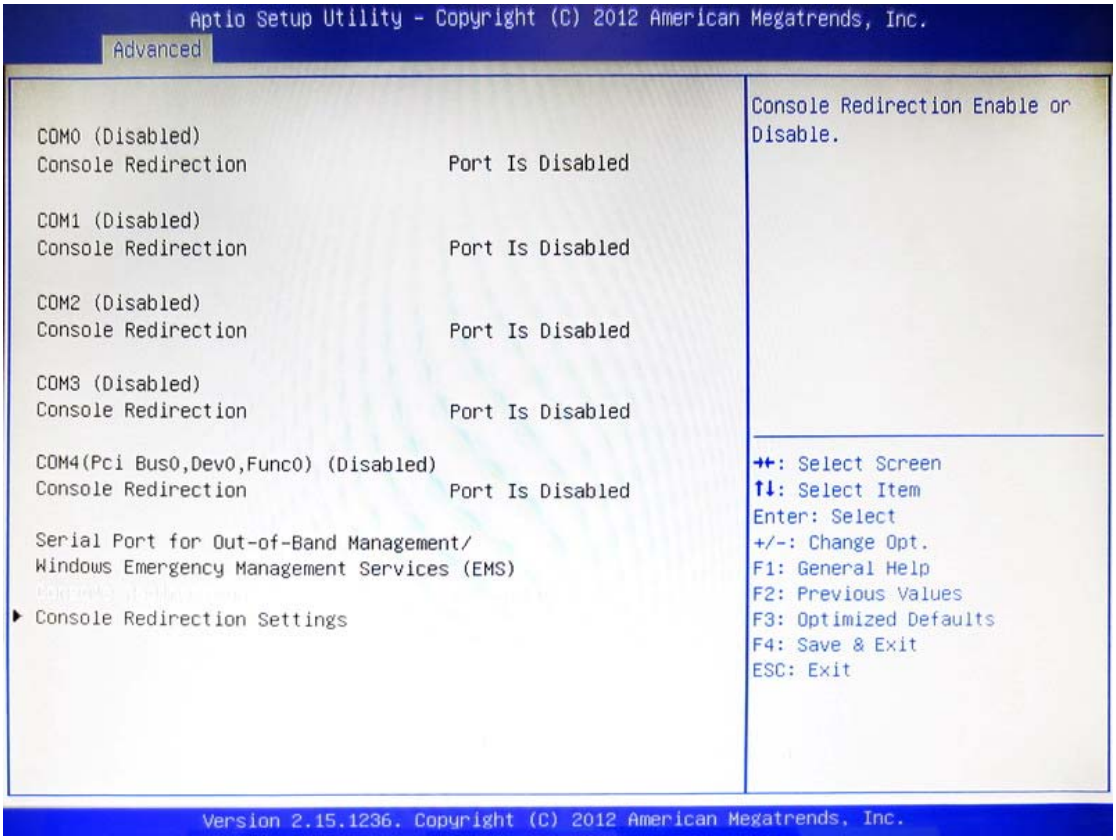
4.2.11.1 Smart Fan Mode Configuration


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Smart Fan Mode Configuration
Smart Fan Control [Auto Duty-Cycle Mode]
Temperature 1 60
Temperature 2 50
Temperature 3 40
Temperature 4 30
Duty Cycle 1 85
Duty Cycle 2 70
Duty Cycle 3 60
Duty Cycle 4 50
Smart Fan Mode Select

Smart Fan Control: Select System Smart Fan Mode.

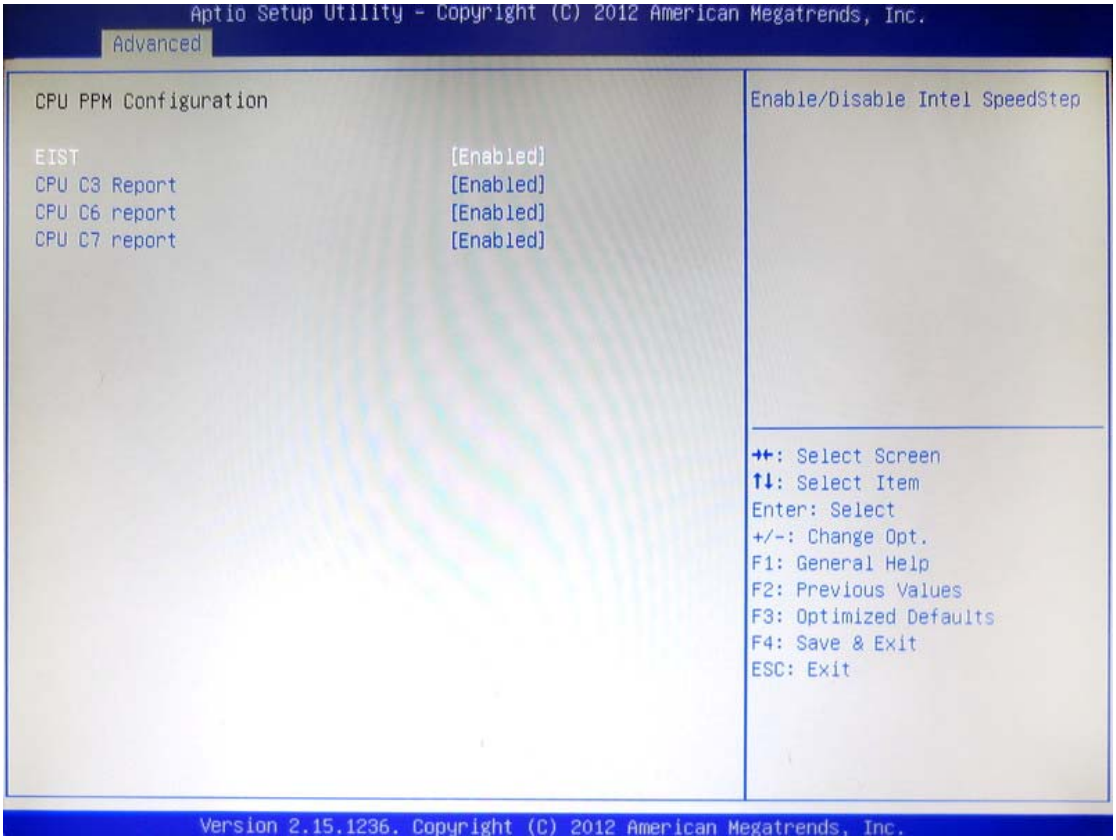
4.2.12 Serial Port Console Redirection

Serial port console redirection settings.

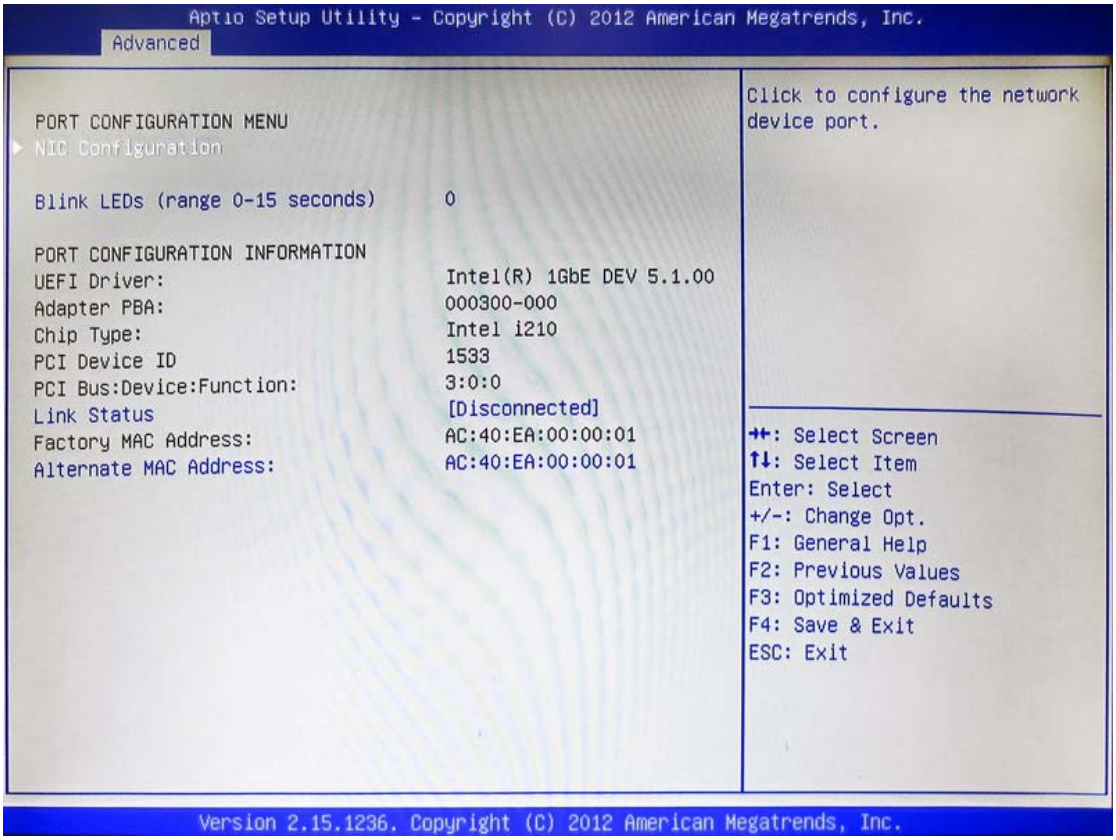


4.2.13 CPU PPM Configuration

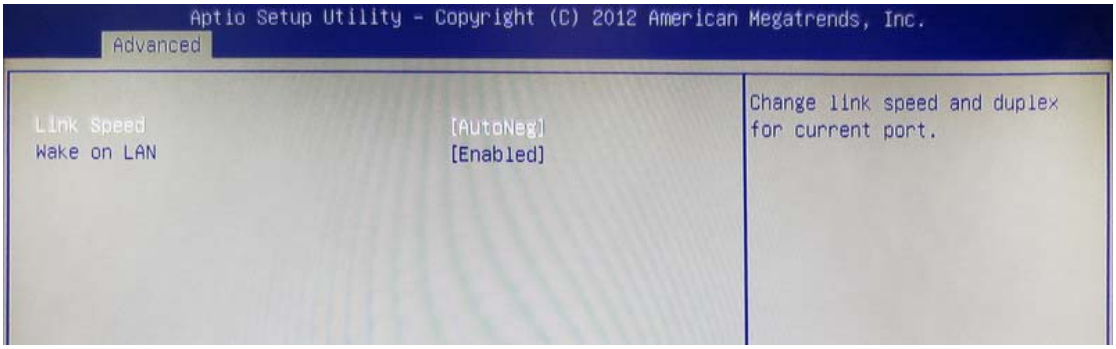
Intel SpeedStep settings.



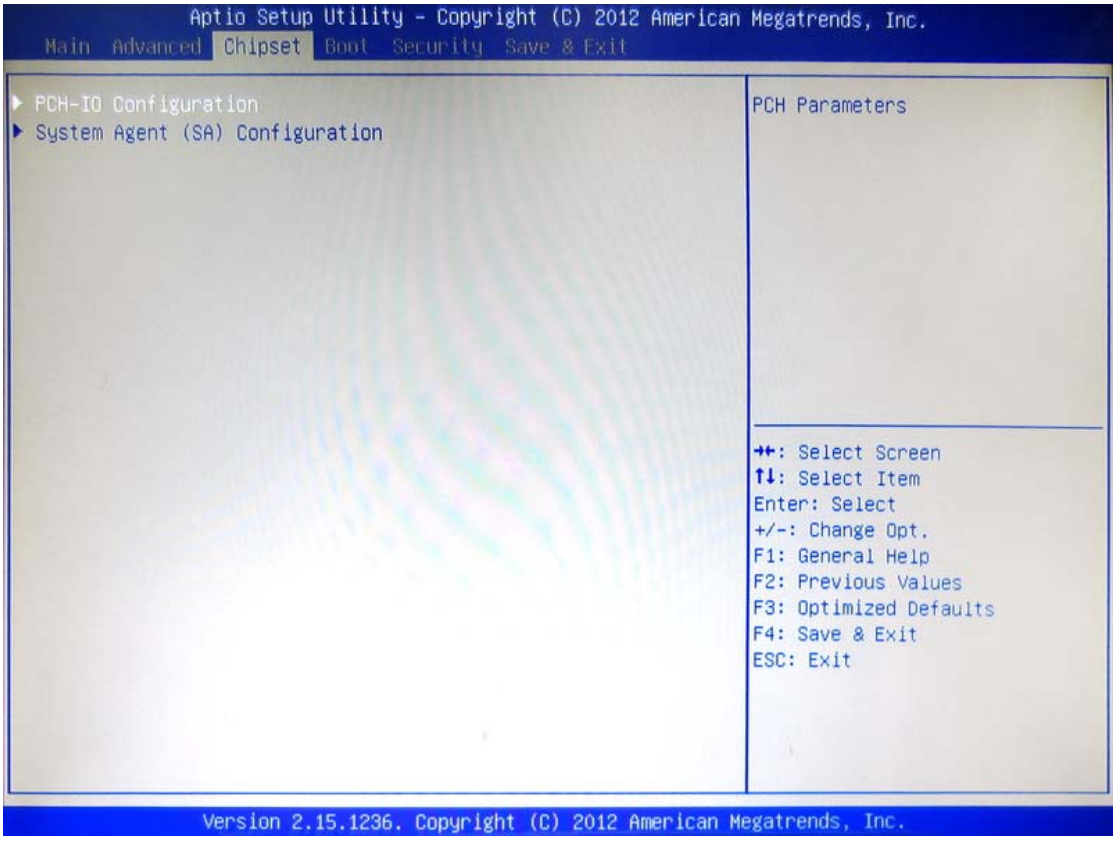
4.2.14 Intel I210 Gigabit Network Connection



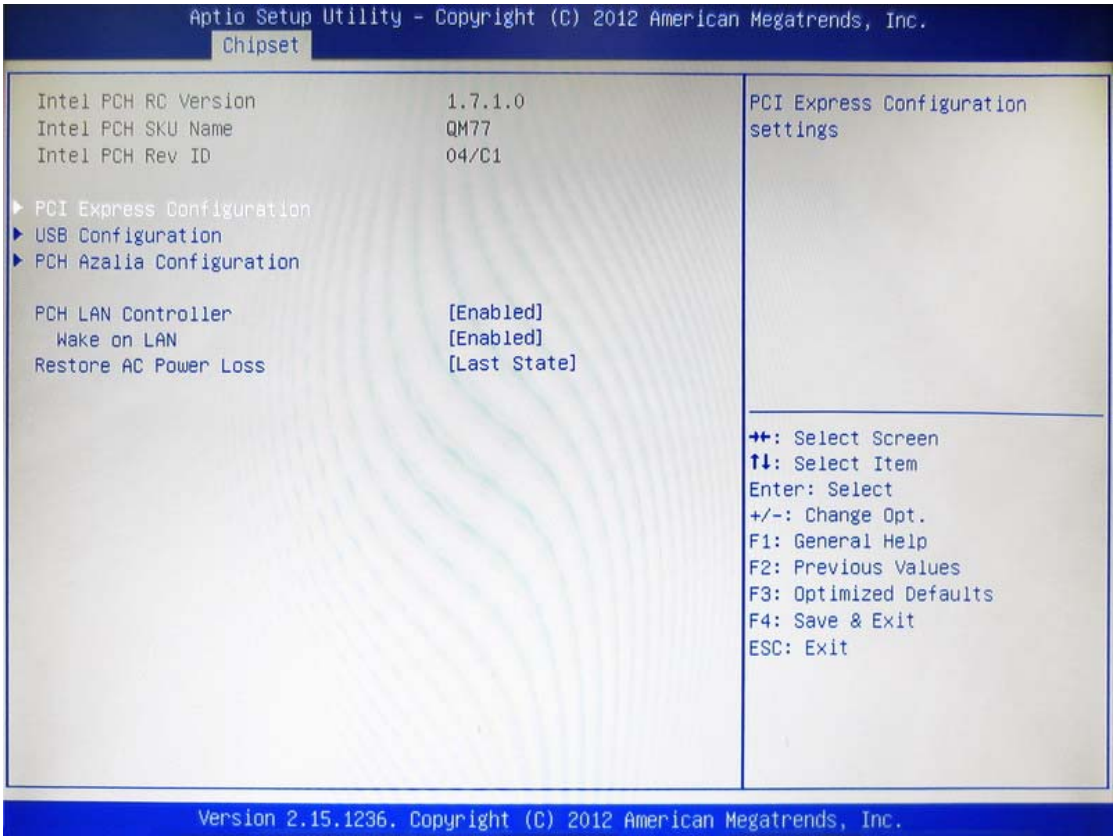
4.2.14.1 NIC Configuration


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Link Speed [AutoNeg]
Wake on LAN [Enabled]
Change link speed and duplex for current port.

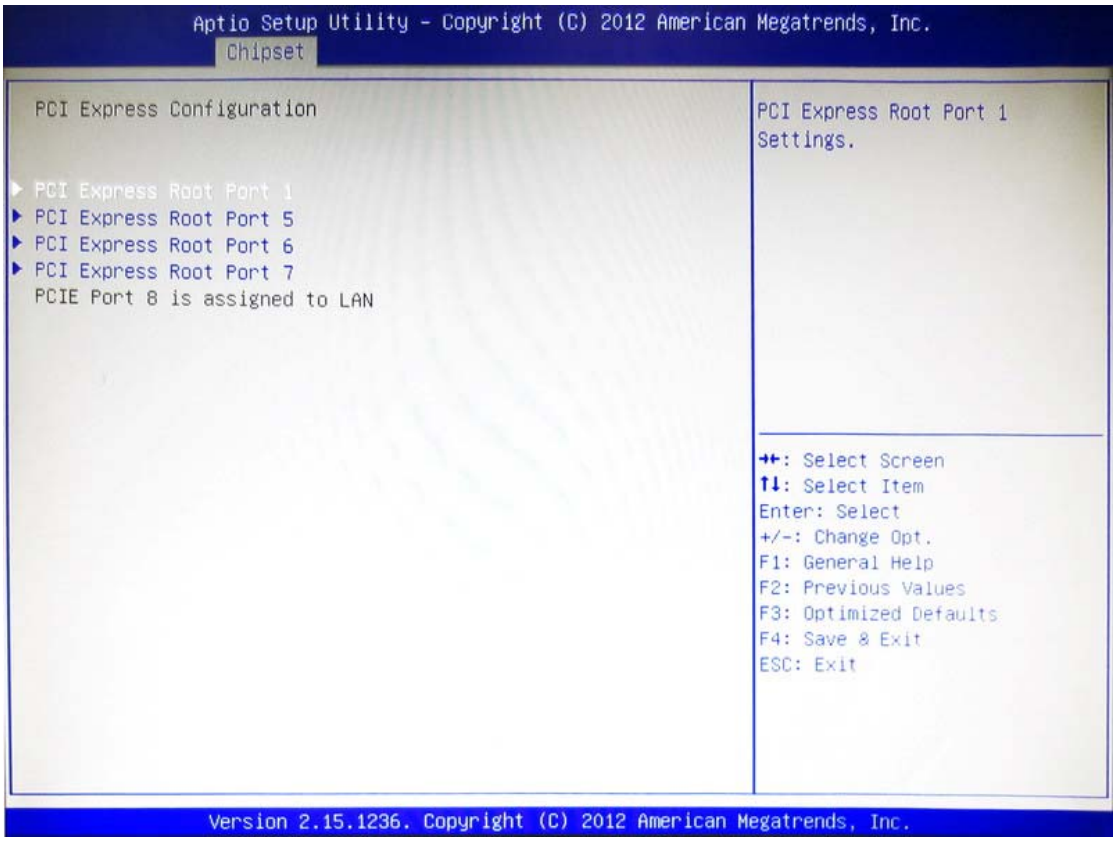
4.3 Chipset


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
PCH-IO Configuration
System Agent (SA) Configuration
PCH Parameters
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

4.3.1 PCH-IO Configuration



4.3.1.1 PCI Express Configuration

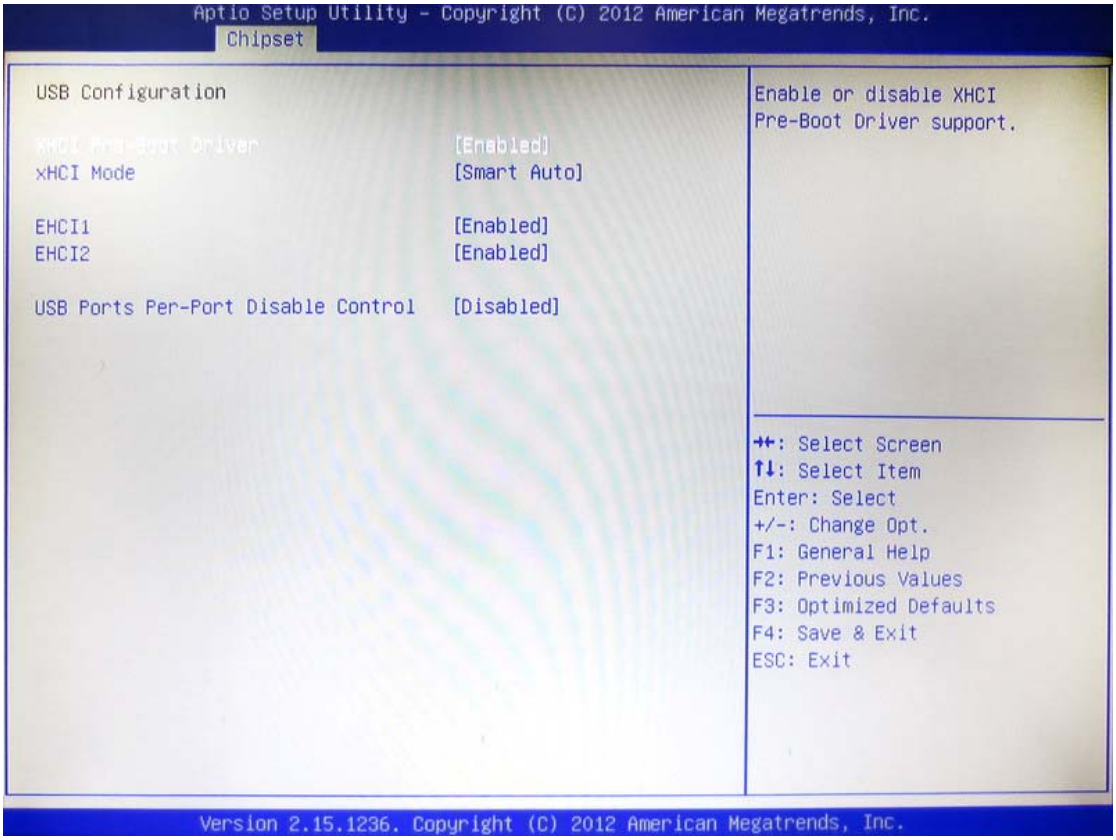

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Chipset
PCI Express Configuration
PCI Express Root Port 1
PCI Express Root Port 5
PCI Express Root Port 6
PCI Express Root Port 7
PCIE Port 8 is assigned to LAN
PCI Express Root Port 1 Settings.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

PCI Express Root Port

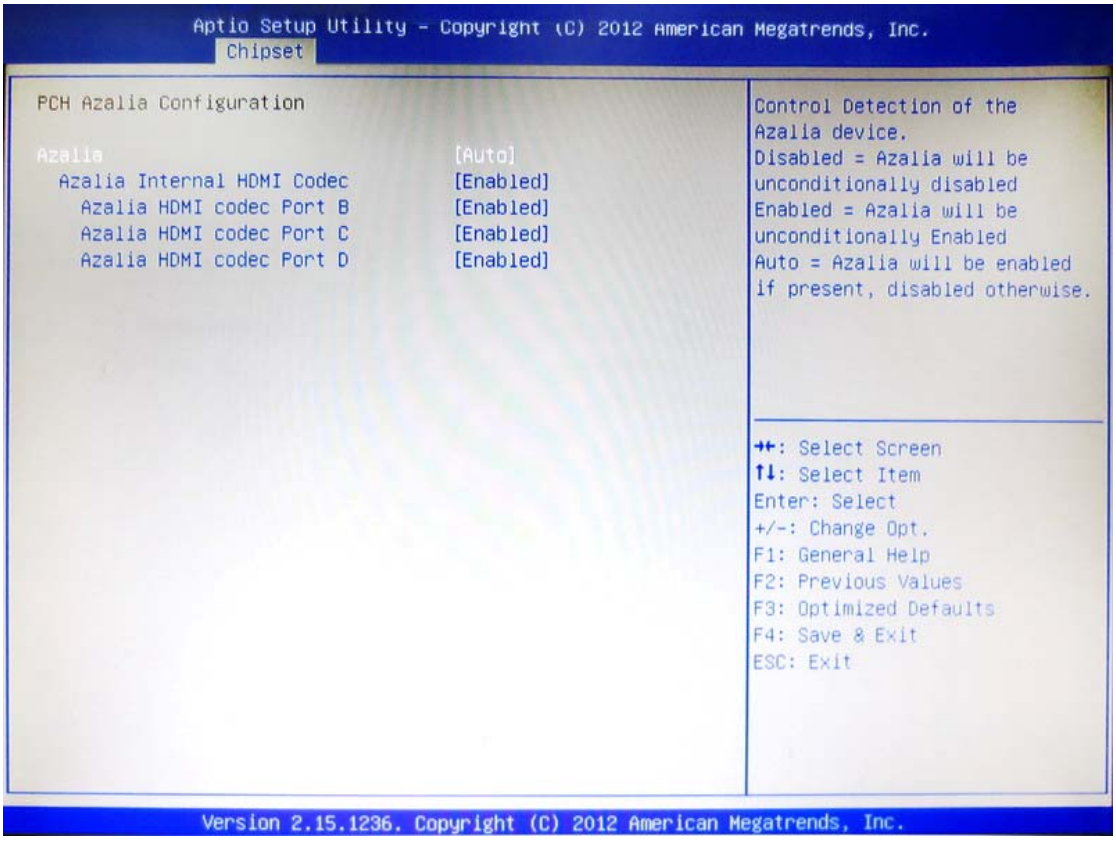
Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Chipset
PCI Express Root Port 1 [Enabled]
ASPM Support [Auto]
PCIe Speed [Auto]
Control the PCI Express Root Port.

Each PCI Express Root Port can be enabled or disabled individually.

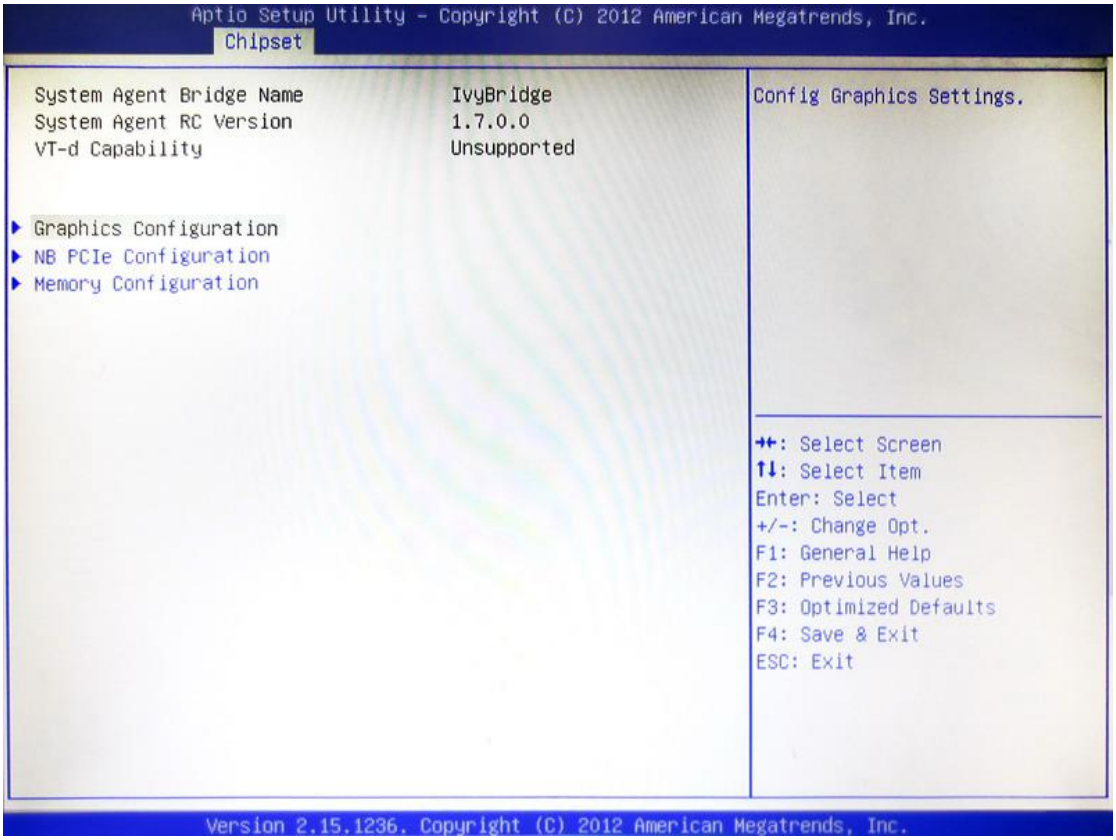
4.3.1.2 USB Configuration



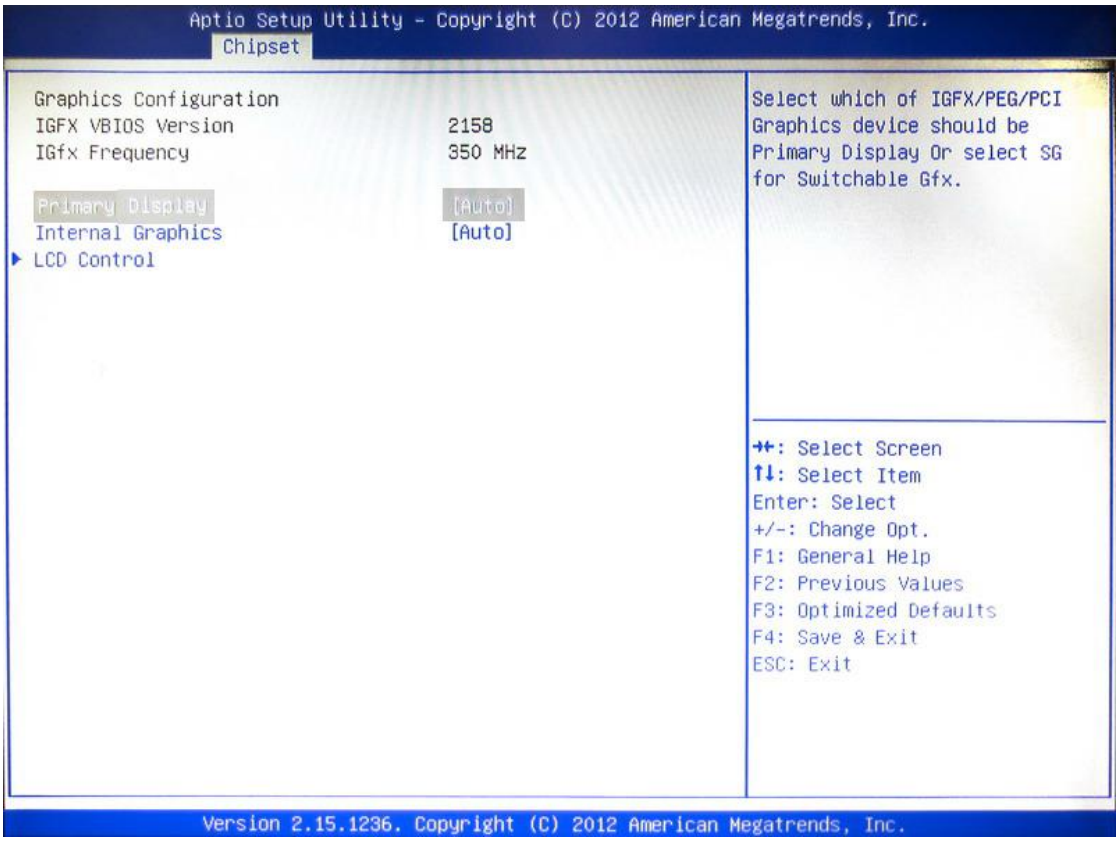
4.3.1.3 PCH Azalia Configuration


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Chipset
PCH Azalia Configuration
Azalia [Auto]
Azalia Internal HDMI Codec [Enabled]
Azalia HDMI codec Port B [Enabled]
Azalia HDMI codec Port C [Enabled]
Azalia HDMI codec Port D [Enabled]
Control Detection of the Azalia device.
Disabled = Azalia will be unconditionally disabled
Enabled = Azalia will be unconditionally Enabled
Auto = Azalia will be enabled if present, disabled otherwise.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

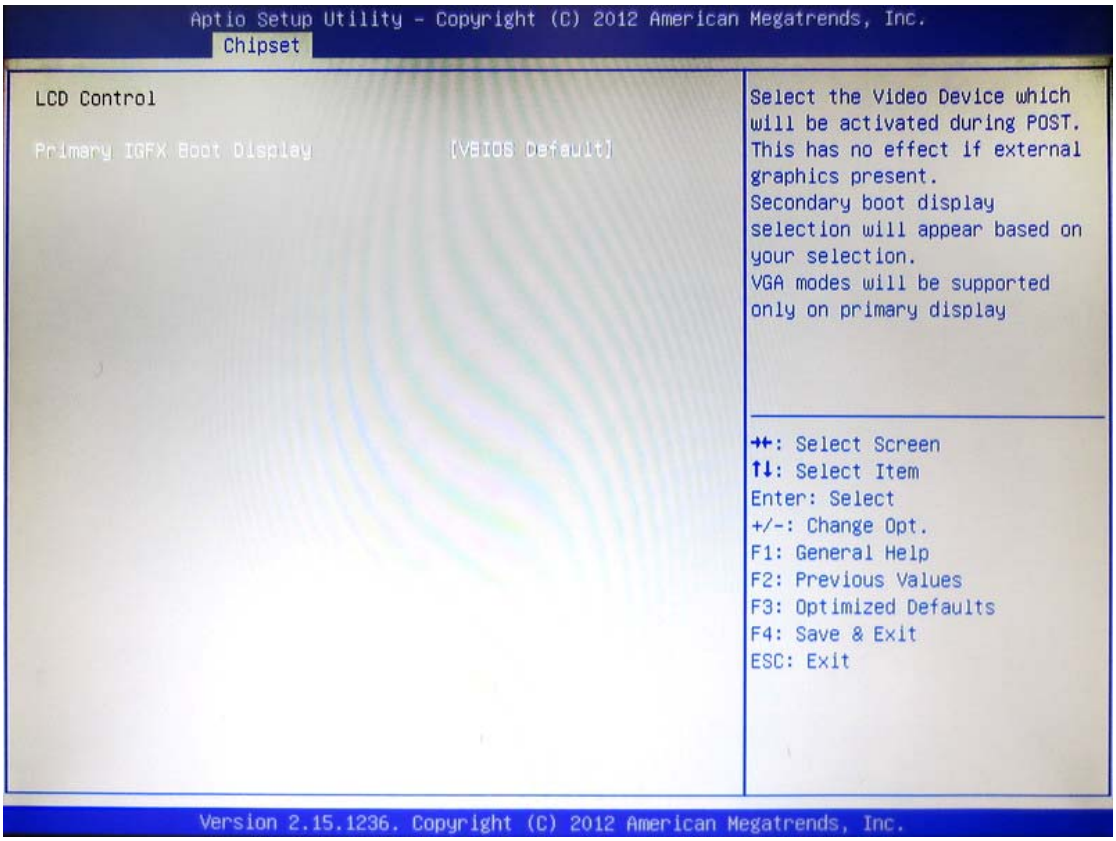
4.3.2 System Agent Configuration



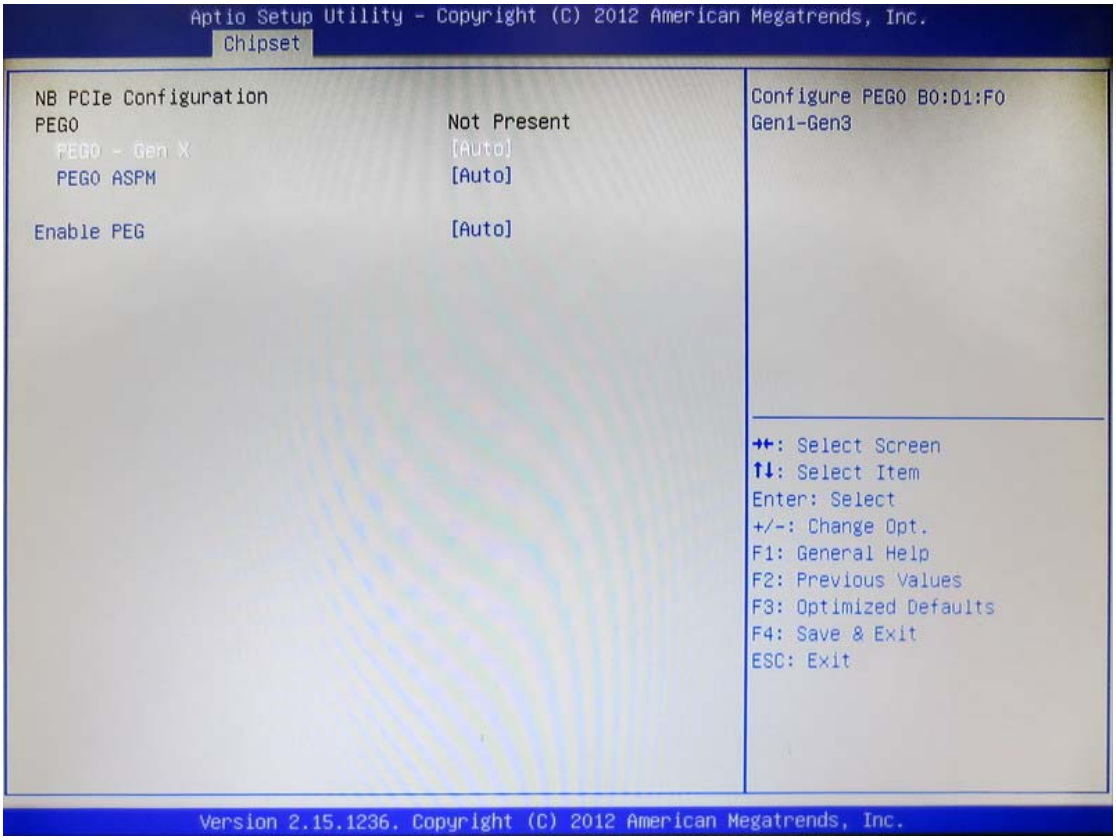
4.3.2.1 Graphics Configuration


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Chipset
Graphics Configuration
IGFX VBIOS Version 2158
IGfx Frequency 350 MHz
Primary Display [Auto]
Internal Graphics [Auto]
LCD Control
Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

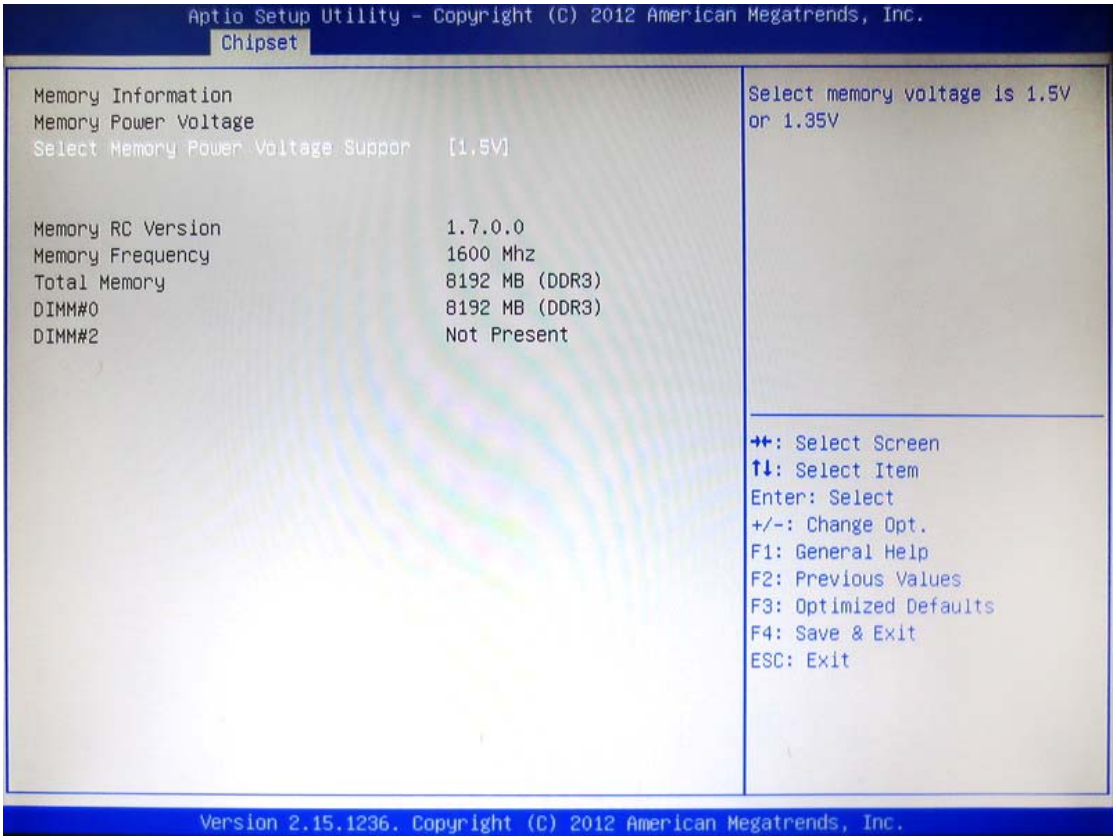
LCD Control


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Chipset
LCD Control
Primary IGFX Boot Display [VBIOS Default]
Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

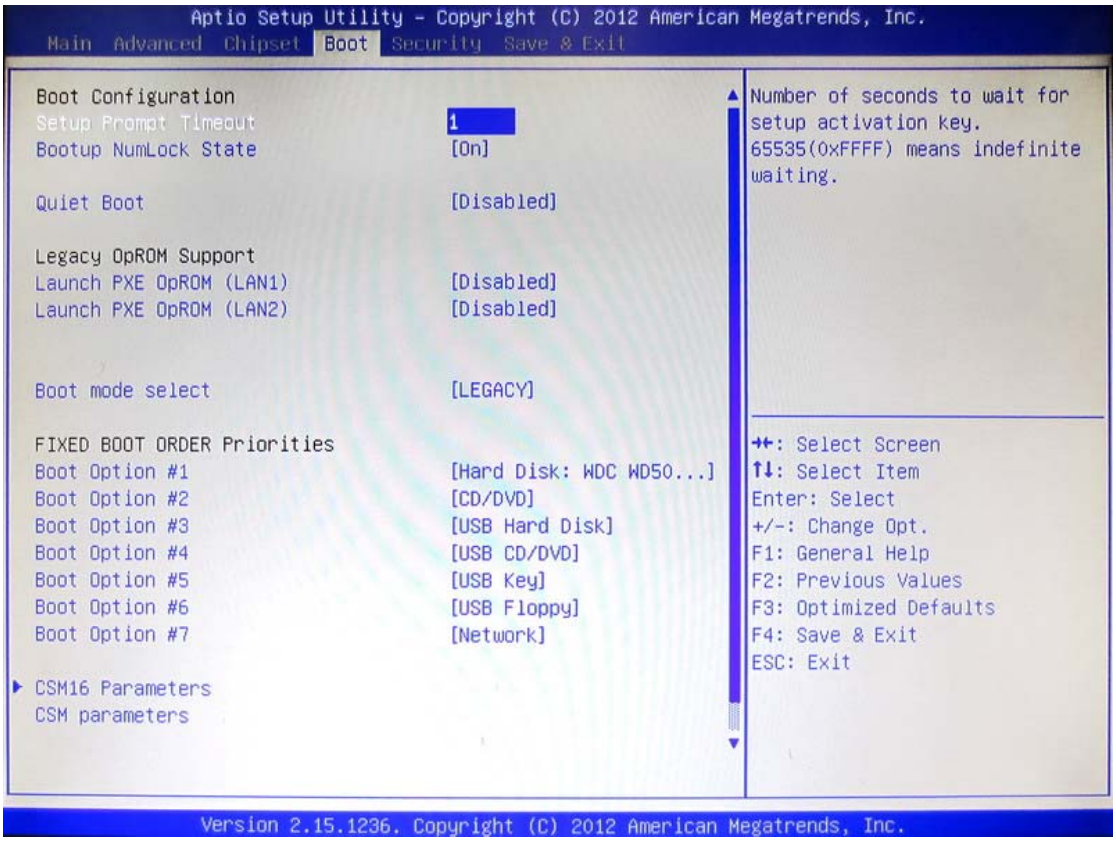
4.3.2.2 NB PCIe Configuration



4.3.2.3 Memory Configuration


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Chipset
Memory Information
Memory Power Voltage
Select Memory Power Voltage Suppor [1.5V]
Memory RC Version 1.7.0.0
Memory Frequency 1600 Mhz
Total Memory 8192 MB (DDR3)
DIMM#0 8192 MB (DDR3)
DIMM#2 Not Present
Select memory voltage is 1.5V or 1.35V
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

4.4 Boot



Boot Configuration: Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.

Bootup NumLock State: Select [Enable] or [Disable] for the keyboard NumLock state.

Quiet Boot: Enables or disables Quiet Boot option.

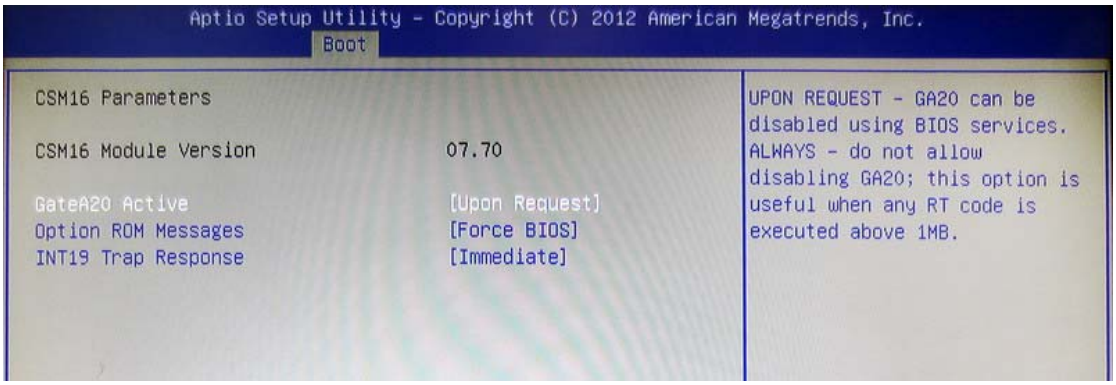
Boot Order Priorities: Set the system boot order.

CSM Parameters: Compatibility Support Module configuration options.

Hard Drive BBS Priorities: Set the order of the legacy devices in this group.

4.4.1.1 CSM16 Parameters

OpROM execution, boot options filter, etc.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Boot
CSM16 Parameters
CSM16 Module Version 07.70
GateA20 Active [Upon Request]
Option ROM Messages [Force BIOS]
INT19 Trap Response [Immediate]
UPON REQUEST – GA20 can be disabled using BIOS services. ALWAYS – do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

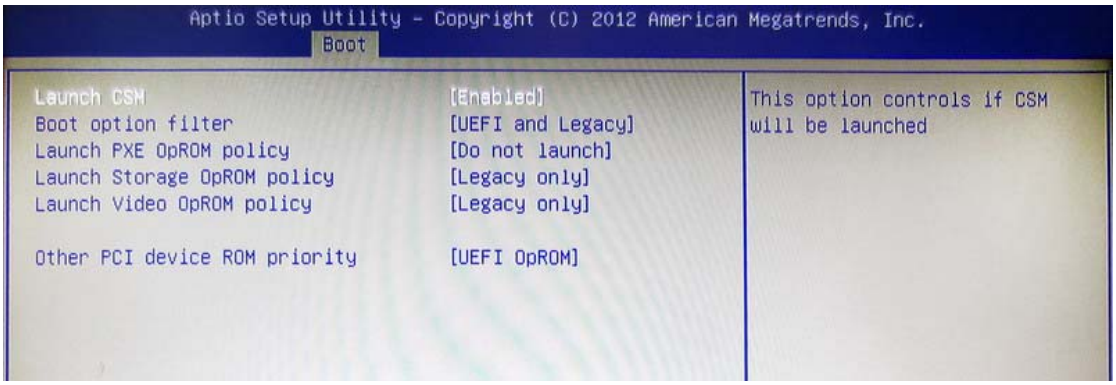
GateA20 Active:

[Upon Request] – GA20 can be disabled using BIOS services.

[Always] – do not allow disabling GA20; this option is useful wen any RT code is executed above 1MB.

Option ROM Message: Set display mode [Force BIOS] or [Keep Current] for Option ROM.

4.4.1.2 CSM Parameters


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Boot
Launch CSM [Enabled]
Boot option filter [UEFI and Legacy]
Launch PXE OpROM policy [Do not launch]
Launch Storage OpROM policy [Legacy only]
Launch Video OpROM policy [Legacy only]
Other PCI device ROM priority [UEFI OpROM]
This option controls if CSM will be launched

Launch CSM: This option controls if CSM will be launched always or never.

Boot option filer: This option controls what devices system can boot to [UEFI and Legacy], [Legacy only] or [UEFI only].

Launch PXE OpROM policy: This controls the execution of UEFI and Legacy PXE OpROM, [Do not launch], [UEFI only] or [Legacy only].

Launch Storage OpROM policy: This controls the execution of UEFI and Legacy Storage OpROM, [Do not launch], [UEFI only] or [Legacy only].

Launch Video OpROM policy: This controls the execution of UEFI and Legacy Video OpROM, [Do not launch], [UEFI only] or [Legacy only].

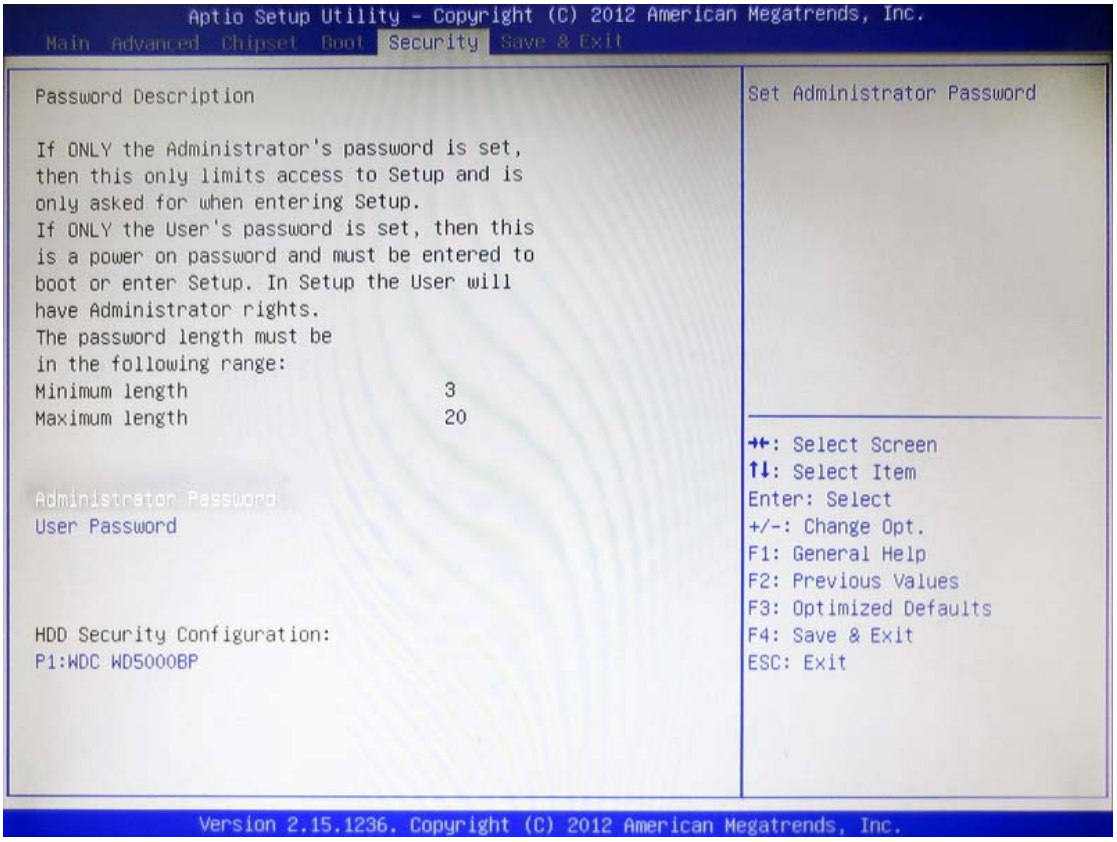
Other PCI device ROM priority: For PCI devices other than Network, Mass storage or Video defines which OpROM to launch, [UEFI OpROM] or [Legacy OpROM].

4.4.1.3 Hard Drive BBS Priorities

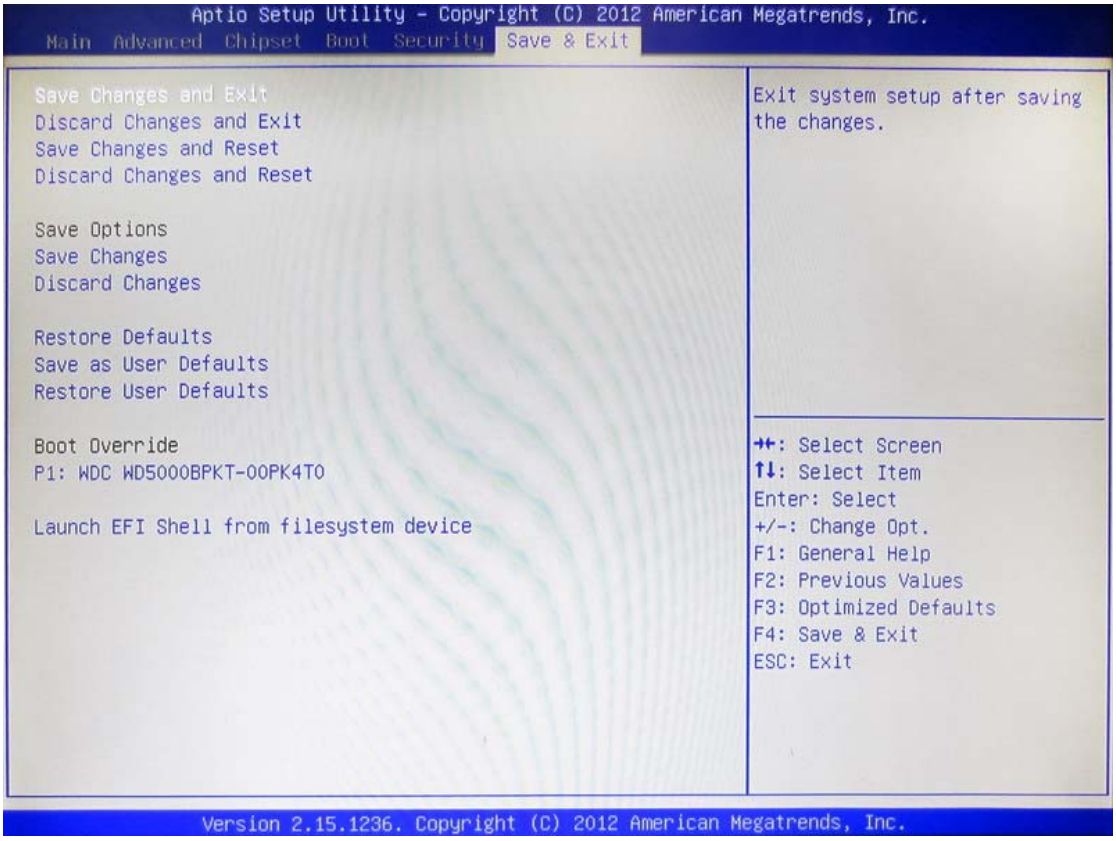
Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Boot
Boot Option #1
[P1: WDC WD5000BPKT-...]
Sets the system boot order

4.5 Security

Administrator's and User's passwords could be set.
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup, the user will have administrator rights. The minimum length of the password is 3 and the maximum length is 20.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Password Description
If ONLY the Administrator's password is set,
then this only limits access to Setup and is
only asked for when entering Setup.
If ONLY the User's password is set, then this
is a power on password and must be entered to
boot or enter Setup. In Setup the User will
have Administrator rights.
The password length must be
in the following range:
Minimum length 3
Maximum length 20
Administrator Password
User Password
HDD Security Configuration:
P1:WDC WD5000BP
Set Administrator Password
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

4.6 Save and Exit

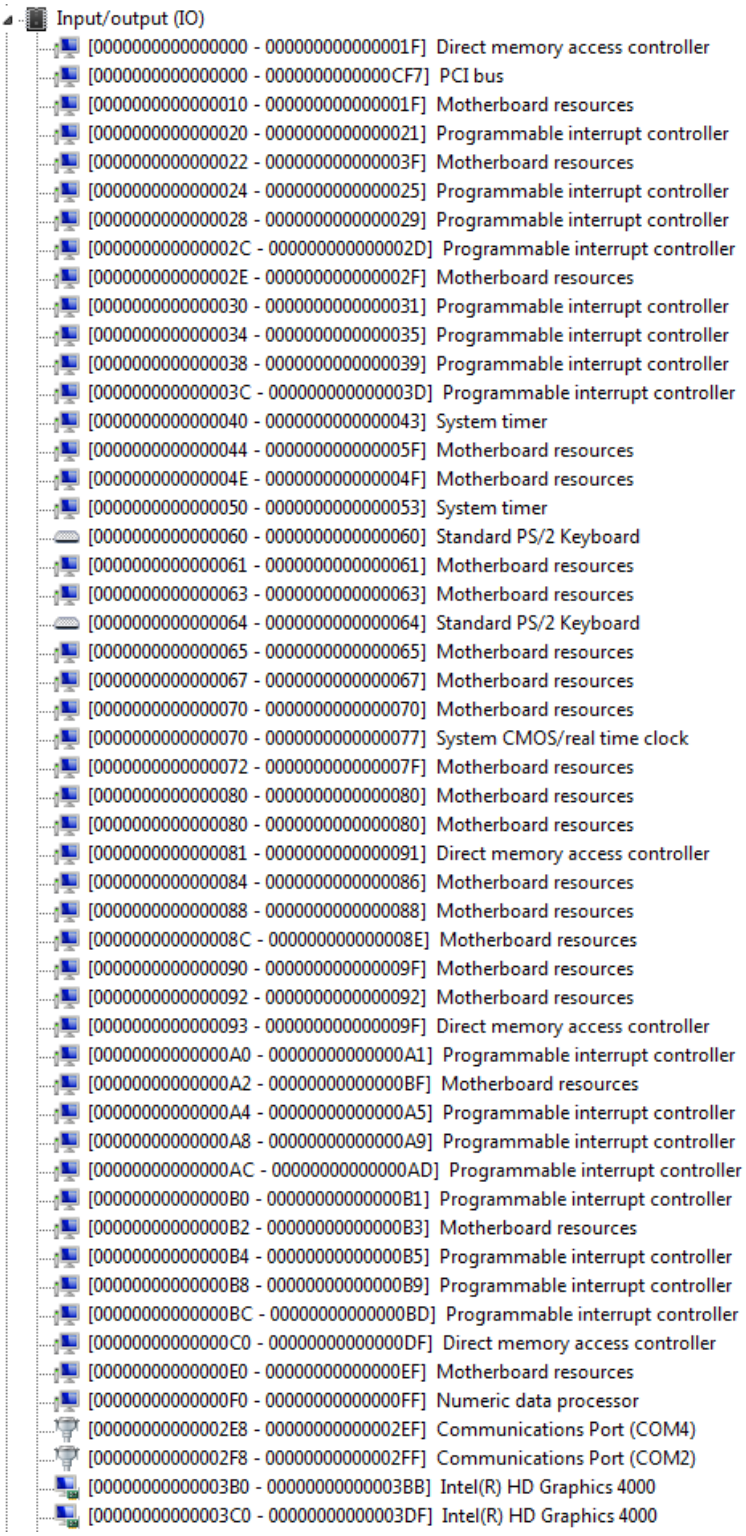


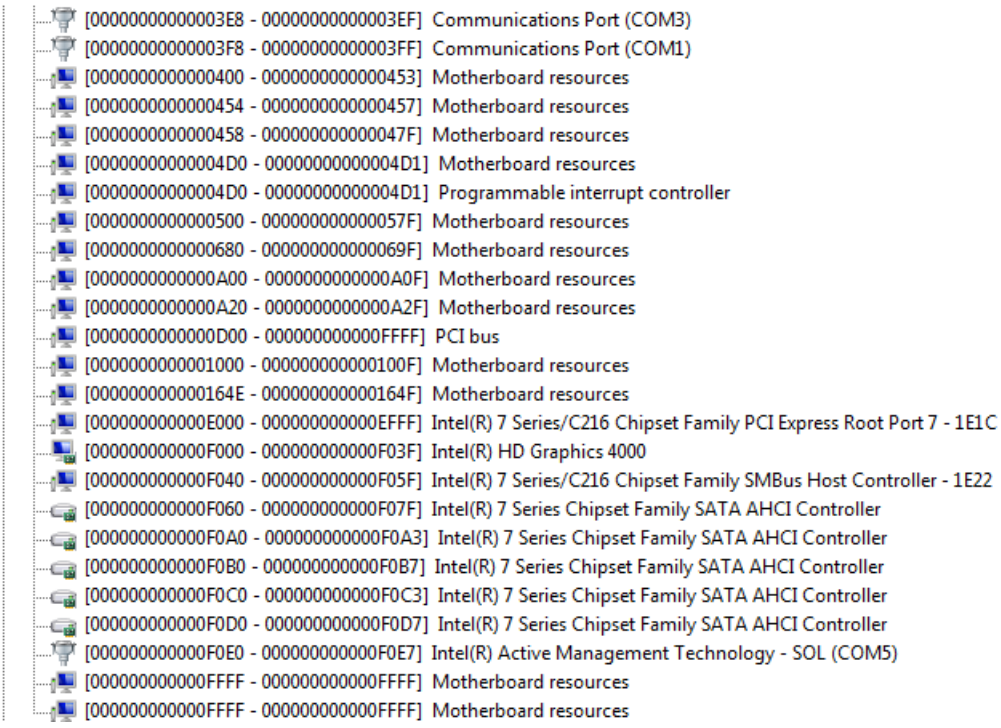
Save Changes and Exit: Exit system setup after saving the changes.
Discard Changes and Exit: Exit system setup without saving any changes.
Save Changes and Reset: Reset the system after saving the changes.
Discard Changes and Reset: Reset system setup without saving any changes.
Save Changes: Save Changes done so far to any of the setup options.
Discard Changes: Discard Changes done so far to any of the setup options.
Restore Defaults: Restore/Load Default values for all the setup options.
Save as User Defaults: Save the changes done so far as user Defaults.
Restore user Defaults: Restore the User Defaults to all the setup options.
Launch EFI Shell from filesystem device: Attempts to Launch EFI Shell application (Shellx64.efi) from one of the available filesystem devices.

5. Address Map

5.1 I/O Port Address Map

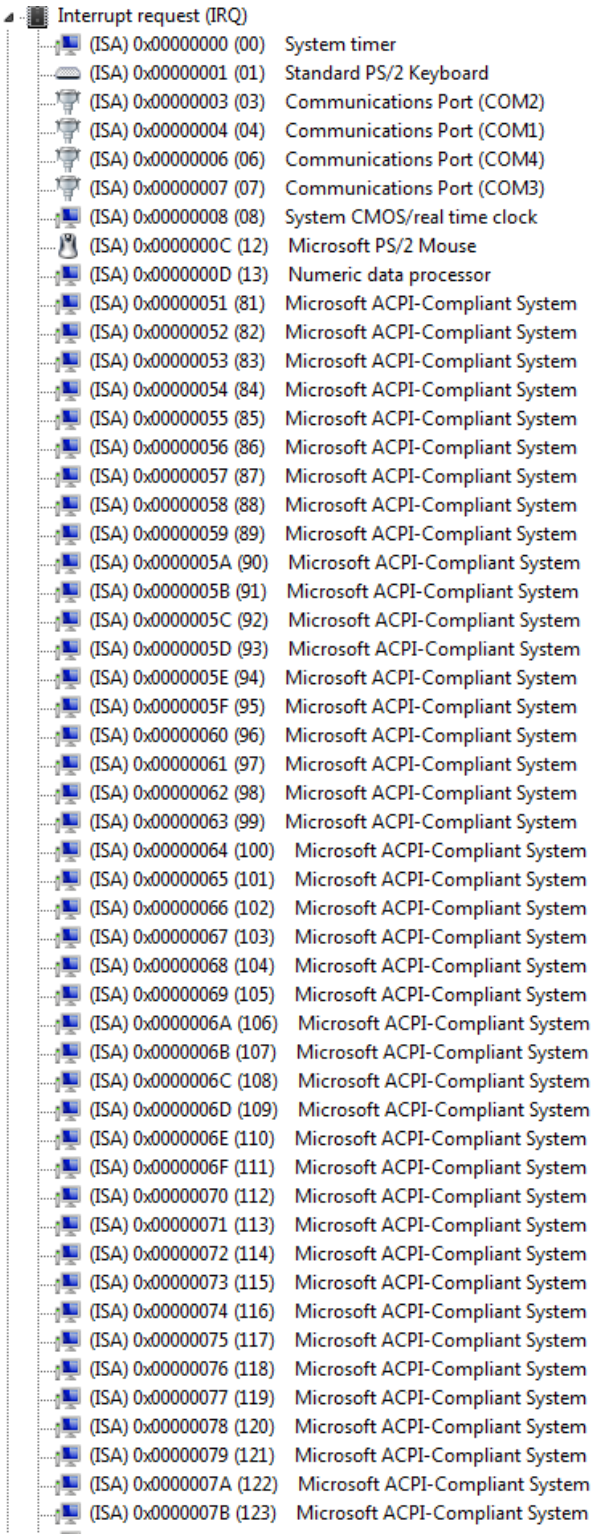
The assignments of the I/O port addresses for the BX-PIB0x under Windows® 7 Ultimate 64-bit are shown below.




[00000000000003E8 - 00000000000003EF] Communications Port (COM3)
[00000000000003F8 - 00000000000003FF] Communications Port (COM1)
[0000000000000400 - 0000000000000453] Motherboard resources
[0000000000000454 - 0000000000000457] Motherboard resources
[0000000000000458 - 000000000000047F] Motherboard resources
[00000000000004D0 - 00000000000004D1] Motherboard resources
[00000000000004D0 - 00000000000004D1] Programmable interrupt controller
[0000000000000500 - 000000000000057F] Motherboard resources
[0000000000000680 - 000000000000069F] Motherboard resources
[0000000000000A00 - 0000000000000A0F] Motherboard resources
[0000000000000A20 - 0000000000000A2F] Motherboard resources
[0000000000000D00 - 0000000000000FFFF] PCI bus
[0000000000001000 - 000000000000100F] Motherboard resources
[000000000000164E - 000000000000164F] Motherboard resources
[000000000000E000 - 000000000000EFFF] Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 7 - 1E1C
[000000000000F000 - 000000000000F03F] Intel(R) HD Graphics 4000
[000000000000F040 - 000000000000F05F] Intel(R) 7 Series/C216 Chipset Family SMBus Host Controller - 1E22
[000000000000F060 - 000000000000F07F] Intel(R) 7 Series Chipset Family SATA AHCI Controller
[000000000000F0A0 - 000000000000F0A3] Intel(R) 7 Series Chipset Family SATA AHCI Controller
[000000000000F0B0 - 000000000000F0B7] Intel(R) 7 Series Chipset Family SATA AHCI Controller
[000000000000F0C0 - 000000000000F0C3] Intel(R) 7 Series Chipset Family SATA AHCI Controller
[000000000000F0D0 - 000000000000F0D7] Intel(R) 7 Series Chipset Family SATA AHCI Controller
[000000000000F0E0 - 000000000000F0E7] Intel(R) Active Management Technology - SOL (COM5)
[000000000000FFFF - 000000000000FFFF] Motherboard resources
[000000000000FFFF - 000000000000FFFF] Motherboard resources

5.2 Interrupt Controller (IRQ) Map

The interrupt controller map for the BX-PIB0x under Windows® 7 Ultimate 64-bit is shown below.


Interrupt request (IRQ)
(ISA) 0x00000000 (00) System timer
(ISA) 0x00000001 (01) Standard PS/2 Keyboard
(ISA) 0x00000003 (03) Communications Port (COM2)
(ISA) 0x00000004 (04) Communications Port (COM1)
(ISA) 0x00000006 (06) Communications Port (COM4)
(ISA) 0x00000007 (07) Communications Port (COM3)
(ISA) 0x00000008 (08) System CMOS/real time clock
(ISA) 0x0000000C (12) Microsoft PS/2 Mouse
(ISA) 0x0000000D (13) Numeric data processor
(ISA) 0x00000051 (81) Microsoft ACPI-Compliant System
(ISA) 0x00000052 (82) Microsoft ACPI-Compliant System
(ISA) 0x00000053 (83) Microsoft ACPI-Compliant System
(ISA) 0x00000054 (84) Microsoft ACPI-Compliant System
(ISA) 0x00000055 (85) Microsoft ACPI-Compliant System
(ISA) 0x00000056 (86) Microsoft ACPI-Compliant System
(ISA) 0x00000057 (87) Microsoft ACPI-Compliant System
(ISA) 0x00000058 (88) Microsoft ACPI-Compliant System
(ISA) 0x00000059 (89) Microsoft ACPI-Compliant System
(ISA) 0x0000005A (90) Microsoft ACPI-Compliant System
(ISA) 0x0000005B (91) Microsoft ACPI-Compliant System
(ISA) 0x0000005C (92) Microsoft ACPI-Compliant System
(ISA) 0x0000005D (93) Microsoft ACPI-Compliant System
(ISA) 0x0000005E (94) Microsoft ACPI-Compliant System
(ISA) 0x0000005F (95) Microsoft ACPI-Compliant System
(ISA) 0x00000060 (96) Microsoft ACPI-Compliant System
(ISA) 0x00000061 (97) Microsoft ACPI-Compliant System
(ISA) 0x00000062 (98) Microsoft ACPI-Compliant System
(ISA) 0x00000063 (99) Microsoft ACPI-Compliant System
(ISA) 0x00000064 (100) Microsoft ACPI-Compliant System
(ISA) 0x00000065 (101) Microsoft ACPI-Compliant System
(ISA) 0x00000066 (102) Microsoft ACPI-Compliant System
(ISA) 0x00000067 (103) Microsoft ACPI-Compliant System
(ISA) 0x00000068 (104) Microsoft ACPI-Compliant System
(ISA) 0x00000069 (105) Microsoft ACPI-Compliant System
(ISA) 0x0000006A (106) Microsoft ACPI-Compliant System
(ISA) 0x0000006B (107) Microsoft ACPI-Compliant System
(ISA) 0x0000006C (108) Microsoft ACPI-Compliant System
(ISA) 0x0000006D (109) Microsoft ACPI-Compliant System
(ISA) 0x0000006E (110) Microsoft ACPI-Compliant System
(ISA) 0x0000006F (111) Microsoft ACPI-Compliant System
(ISA) 0x00000070 (112) Microsoft ACPI-Compliant System
(ISA) 0x00000071 (113) Microsoft ACPI-Compliant System
(ISA) 0x00000072 (114) Microsoft ACPI-Compliant System
(ISA) 0x00000073 (115) Microsoft ACPI-Compliant System
(ISA) 0x00000074 (116) Microsoft ACPI-Compliant System
(ISA) 0x00000075 (117) Microsoft ACPI-Compliant System
(ISA) 0x00000076 (118) Microsoft ACPI-Compliant System
(ISA) 0x00000077 (119) Microsoft ACPI-Compliant System
(ISA) 0x00000078 (120) Microsoft ACPI-Compliant System
(ISA) 0x00000079 (121) Microsoft ACPI-Compliant System
(ISA) 0x0000007A (122) Microsoft ACPI-Compliant System
(ISA) 0x0000007B (123) Microsoft ACPI-Compliant System

Interrupt Controller (IRQ) Map (cont'd)

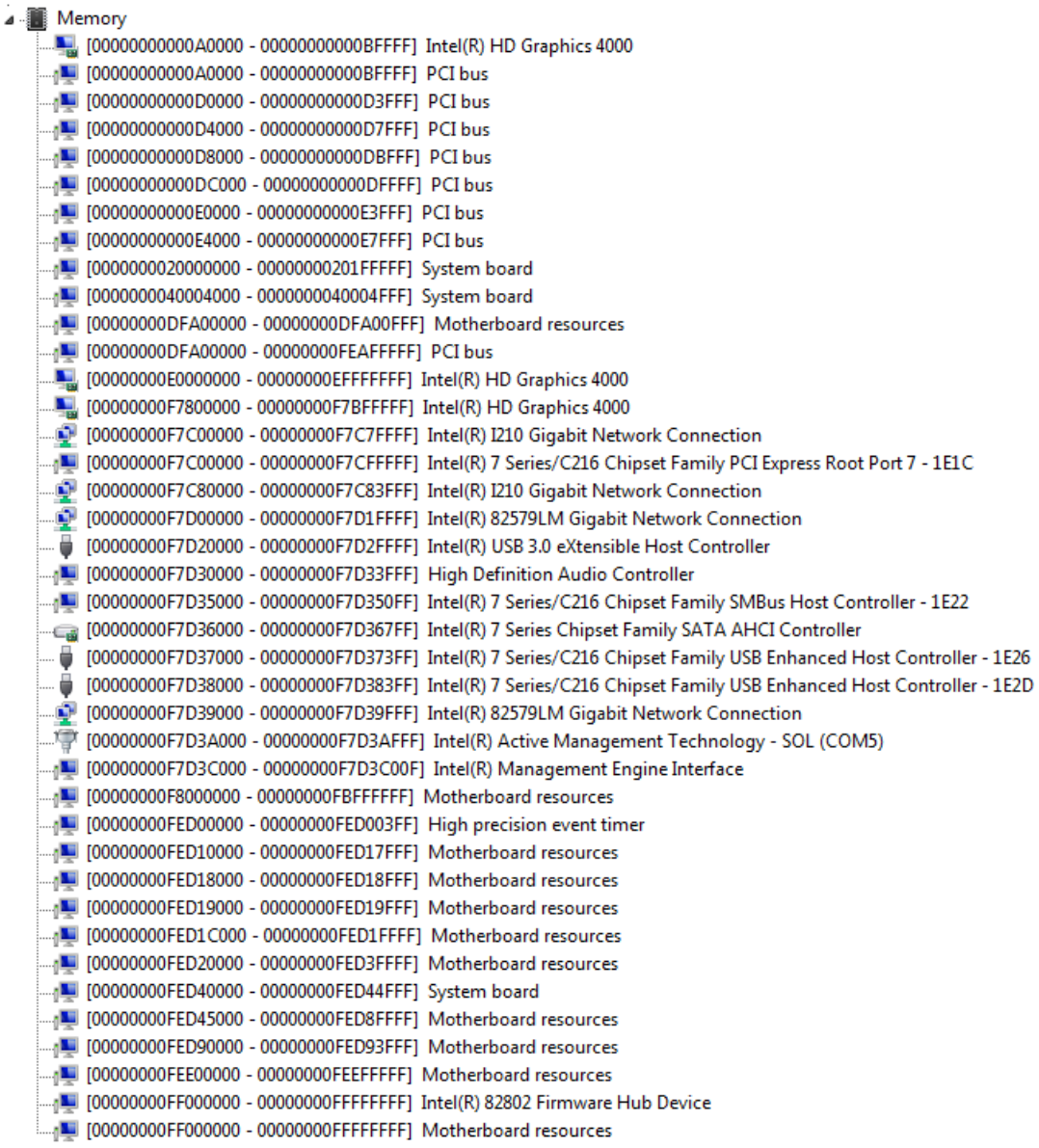
(ISA) 0x0000007C (124) Microsoft ACPI-Compliant System
(ISA) 0x0000007D (125) Microsoft ACPI-Compliant System
(ISA) 0x0000007E (126) Microsoft ACPI-Compliant System
(ISA) 0x0000007F (127) Microsoft ACPI-Compliant System
(ISA) 0x00000080 (128) Microsoft ACPI-Compliant System
(ISA) 0x00000081 (129) Microsoft ACPI-Compliant System
(ISA) 0x00000082 (130) Microsoft ACPI-Compliant System
(ISA) 0x00000083 (131) Microsoft ACPI-Compliant System
(ISA) 0x00000084 (132) Microsoft ACPI-Compliant System
(ISA) 0x00000085 (133) Microsoft ACPI-Compliant System
(ISA) 0x00000086 (134) Microsoft ACPI-Compliant System
(ISA) 0x00000087 (135) Microsoft ACPI-Compliant System
(ISA) 0x00000088 (136) Microsoft ACPI-Compliant System
(ISA) 0x00000089 (137) Microsoft ACPI-Compliant System
(ISA) 0x0000008A (138) Microsoft ACPI-Compliant System
(ISA) 0x0000008B (139) Microsoft ACPI-Compliant System
(ISA) 0x0000008C (140) Microsoft ACPI-Compliant System
(ISA) 0x0000008D (141) Microsoft ACPI-Compliant System
(ISA) 0x0000008E (142) Microsoft ACPI-Compliant System
(ISA) 0x0000008F (143) Microsoft ACPI-Compliant System
(ISA) 0x00000090 (144) Microsoft ACPI-Compliant System
(ISA) 0x00000091 (145) Microsoft ACPI-Compliant System
(ISA) 0x00000092 (146) Microsoft ACPI-Compliant System
(ISA) 0x00000093 (147) Microsoft ACPI-Compliant System
(ISA) 0x00000094 (148) Microsoft ACPI-Compliant System
(ISA) 0x00000095 (149) Microsoft ACPI-Compliant System
(ISA) 0x00000096 (150) Microsoft ACPI-Compliant System
(ISA) 0x00000097 (151) Microsoft ACPI-Compliant System
(ISA) 0x00000098 (152) Microsoft ACPI-Compliant System
(ISA) 0x00000099 (153) Microsoft ACPI-Compliant System
(ISA) 0x0000009A (154) Microsoft ACPI-Compliant System
(ISA) 0x0000009B (155) Microsoft ACPI-Compliant System
(ISA) 0x0000009C (156) Microsoft ACPI-Compliant System
(ISA) 0x0000009D (157) Microsoft ACPI-Compliant System
(ISA) 0x0000009E (158) Microsoft ACPI-Compliant System
(ISA) 0x0000009F (159) Microsoft ACPI-Compliant System
(ISA) 0x000000A0 (160) Microsoft ACPI-Compliant System
(ISA) 0x000000A1 (161) Microsoft ACPI-Compliant System
(ISA) 0x000000A2 (162) Microsoft ACPI-Compliant System
(ISA) 0x000000A3 (163) Microsoft ACPI-Compliant System
(ISA) 0x000000A4 (164) Microsoft ACPI-Compliant System
(ISA) 0x000000A5 (165) Microsoft ACPI-Compliant System
(ISA) 0x000000A6 (166) Microsoft ACPI-Compliant System
(ISA) 0x000000A7 (167) Microsoft ACPI-Compliant System
(ISA) 0x000000A8 (168) Microsoft ACPI-Compliant System
(ISA) 0x000000A9 (169) Microsoft ACPI-Compliant System
(ISA) 0x000000AA (170) Microsoft ACPI-Compliant System
(ISA) 0x000000AB (171) Microsoft ACPI-Compliant System
(ISA) 0x000000AC (172) Microsoft ACPI-Compliant System
(ISA) 0x000000AD (173) Microsoft ACPI-Compliant System
(ISA) 0x000000AE (174) Microsoft ACPI-Compliant System
(ISA) 0x000000AF (175) Microsoft ACPI-Compliant System
(ISA) 0x000000B0 (176) Microsoft ACPI-Compliant System

Interrupt Controller (IRQ) Map (cont'd)

(ISA) 0x000000B1 (177) Microsoft ACPI-Compliant System
(ISA) 0x000000B2 (178) Microsoft ACPI-Compliant System
(ISA) 0x000000B3 (179) Microsoft ACPI-Compliant System
(ISA) 0x000000B4 (180) Microsoft ACPI-Compliant System
(ISA) 0x000000B5 (181) Microsoft ACPI-Compliant System
(ISA) 0x000000B6 (182) Microsoft ACPI-Compliant System
(ISA) 0x000000B7 (183) Microsoft ACPI-Compliant System
(ISA) 0x000000B8 (184) Microsoft ACPI-Compliant System
(ISA) 0x000000B9 (185) Microsoft ACPI-Compliant System
(ISA) 0x000000BA (186) Microsoft ACPI-Compliant System
(ISA) 0x000000BB (187) Microsoft ACPI-Compliant System
(ISA) 0x000000BC (188) Microsoft ACPI-Compliant System
(ISA) 0x000000BD (189) Microsoft ACPI-Compliant System
(ISA) 0x000000BE (190) Microsoft ACPI-Compliant System
(PCI) 0x0000000A (10) Intel(R) 7 Series/C216 Chipset Family SMBus Host Controller - 1E22
(PCI) 0x00000010 (16) Intel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E2D
(PCI) 0x00000010 (16) Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 1 - 1E10
(PCI) 0x00000010 (16) Intel(R) Management Engine Interface
(PCI) 0x00000012 (18) Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 7 - 1E1C
(PCI) 0x00000013 (19) Intel(R) Active Management Technology - SOL (COM5)
(PCI) 0x00000016 (22) High Definition Audio Controller
(PCI) 0x00000017 (23) Intel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E26
(PCI) 0xFFFFFFF5 (-11) Intel(R) 82579LM Gigabit Network Connection
(PCI) 0xFFFFFFF6 (-10) Intel(R) USB 3.0 eXtensible Host Controller
(PCI) 0xFFFFFFF7 (-9) Intel(R) HD Graphics 4000
(PCI) 0xFFFFFFF8 (-8) Intel(R) I210 Gigabit Network Connection
(PCI) 0xFFFFFFF9 (-7) Intel(R) I210 Gigabit Network Connection
(PCI) 0xFFFFFFFA (-6) Intel(R) I210 Gigabit Network Connection
(PCI) 0xFFFFFFFB (-5) Intel(R) I210 Gigabit Network Connection
(PCI) 0xFFFFFFFC (-4) Intel(R) I210 Gigabit Network Connection
(PCI) 0xFFFFFFFD (-3) Intel(R) I210 Gigabit Network Connection
(PCI) 0xFFFFFFFE (-2) Intel(R) 7 Series Chipset Family SATA AHCI Controller

5.3 Memory Map

The memory map of DRAM for the BX-PIB0x under Windows® 7 Ultimate 64-bit is shown below.


Memory
[00000000000A0000 - 00000000000BFFFF] Intel(R) HD Graphics 4000
[00000000000A0000 - 00000000000BFFFF] PCI bus
[00000000000D0000 - 00000000000D3FFF] PCI bus
[00000000000D4000 - 00000000000D7FFF] PCI bus
[00000000000D8000 - 00000000000DBFFF] PCI bus
[00000000000DC000 - 00000000000DFFFF] PCI bus
[00000000000E0000 - 00000000000E3FFF] PCI bus
[00000000000E4000 - 00000000000E7FFF] PCI bus
[0000000020000000 - 00000000201FFFFF] System board
[0000000040004000 - 0000000040004FFF] System board
[00000000DFA00000 - 00000000DFA00FFF] Motherboard resources
[00000000DFA00000 - 00000000FEAFFFFF] PCI bus
[00000000E0000000 - 00000000EFFFFFFF] Intel(R) HD Graphics 4000
[00000000F7800000 - 00000000F7BFFFFF] Intel(R) HD Graphics 4000
[00000000F7C00000 - 00000000F7C7FFFF] Intel(R) I210 Gigabit Network Connection
[00000000F7C00000 - 00000000F7CFFFFF] Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 7 - 1E1C
[00000000F7C80000 - 00000000F7C83FFF] Intel(R) I210 Gigabit Network Connection
[00000000F7D00000 - 00000000F7D1FFFF] Intel(R) 82579LM Gigabit Network Connection
[00000000F7D20000 - 00000000F7D2FFFF] Intel(R) USB 3.0 eXtensible Host Controller
[00000000F7D30000 - 00000000F7D33FFF] High Definition Audio Controller
[00000000F7D35000 - 00000000F7D350FF] Intel(R) 7 Series/C216 Chipset Family SMBus Host Controller - 1E22
[00000000F7D36000 - 00000000F7D367FF] Intel(R) 7 Series Chipset Family SATA AHCI Controller
[00000000F7D37000 - 00000000F7D373FF] Intel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E26
[00000000F7D38000 - 00000000F7D383FF] Intel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E2D
[00000000F7D39000 - 00000000F7D39FFF] Intel(R) 82579LM Gigabit Network Connection
[00000000F7D3A000 - 00000000F7D3AFFF] Intel(R) Active Management Technology - SOL (COM5)
[00000000F7D3C000 - 00000000F7D3C00F] Intel(R) Management Engine Interface
[00000000F8000000 - 00000000FBFFFFFF] Motherboard resources
[00000000FED00000 - 00000000FED003FF] High precision event timer
[00000000FED10000 - 00000000FED17FFF] Motherboard resources
[00000000FED18000 - 00000000FED18FFF] Motherboard resources
[00000000FED19000 - 00000000FED19FFF] Motherboard resources
[00000000FED1C000 - 00000000FED1FFFF] Motherboard resources
[00000000FED20000 - 00000000FED3FFFF] Motherboard resources
[00000000FED40000 - 00000000FED44FFF] System board
[00000000FED45000 - 00000000FED8FFFF] Motherboard resources
[00000000FED90000 - 00000000FED93FFF] Motherboard resources
[00000000FEE00000 - 00000000FEEFFFFF] Motherboard resources
[00000000FF000000 - 00000000FFFFFFFF] Intel(R) 82802 Firmware Hub Device
[00000000FF000000 - 00000000FFFFFFFF] Motherboard resources